DOCUMENT RESUME

ED 168 082 CS 502 428

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TITLE Real Versus Reel: What's the Verdict?: The Effects of Videotaped Court Materials on Juror Response. Final Report.
INSTITUTION Michigan State Univ., East Lansing. Dept. of Communication.
SPONS AGENCY National Science Foundation, Washington, D.C.
PUB DATE [78]
GRANT NSF-APR-75-15815
NOTE 260p.

EDRS PRICE MF01/PC11 Plus Postage.
DESCRIPTORS Audiovisual Communication; *Court Litigation; Courts; Due Process; Evaluation Criteria; *Justice; Legal Problems; *Media Research; *Production Techniques; *Videotape Recordings

ABSTRACT

An overview of four years of research that evaluated the effects of videotaped testimony on juror information and decision making activities in jury trials, this report contains the executive summary and an empirical report for the second two years of research. The executive summary discusses live versus videotaped trials, live versus color and monochromatic videotaped trials, videotaped segments in an otherwise live trial, deletion of inadmissible material in videotaped trials, editing techniques for deleting inadmissible material, detecting witness deception in videotaped presentations, videotape production techniques, and some general conclusions. The empirical report discusses some of these same topics as they pertain specifically to the final two years of research. Tables, figures, and ten pages of references are included. (MAI)

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Real Versus Reel: What's the Verdict?

THE EFFECTS OF VIDEOTAPED COURT MATERIALS ON JUROR RESPONSE

Final Report

NSF-RANN GRANT APR75-15815

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CS 502 428

All of the materials incorporated in this work were developed with financial support of the National Science Foundation Grants, #GI 38398, Gerald R. Miller and Frederick Siebert Principal Investigators, and #APR75-15815, Gerald R. Miller Principal Investigator. However, any opinions, findings, conclusions, or recommendations expressed herein are those of the authors and do not necessarily reflect the views of the Foundation.

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ACKNOWLEDGEMENTS

The success of an applied research program hinges on the assistance and cooperation of many persons. Our research has taken four years to complete and we owe a debt of gratitude to many individuals who have provided us with both encouragement and assistance. For helping us obtain court facilities and jurors, for playing himself in several of our reenacted trials, and for serving on both of our Advisory Panels, we would particularly like to thank Judge Dale A. Riker of the 68th District Court, Flint, Michigan. From inception to completion, no other person has been more consistently supportive of the research than Judge Riker.

We would also like to express our thanks to those individuals who have served on our Advisory Panels including: Dean Thomas E. Brennan, Cooley Law School; Mr. Joseph Ebersole, Deputy Director of the Federal Judicial Center; Dr. Fredrick Huszagh, Executive Director, Dean Rusk Center for International and Comparative Law, University of Georgia; Judge James McCrystal, Sandusky, Ohio; Mr. Allan Morrill, Attorney; Mr. Thomas Murray, Jr., Attorney; Mr. Eugene Sattler, C.S.R.; Mr. Steven Shiffrin, Attorney; Mr. Douglas Sweet, Attorney; and Mr. Edward Stein, Attorney.

Other jurists and court administrators have also rendered valuable assistance: Judge James Giddings, 54-A District Court, Lansing, Michigan; Judge Bruce Fox, 66th District Court, Corunna, Michigan; Judge Albert P. Horrigan, 68th District Court, Flint, Michigan; Judge Daniel E. Tschirhart, 54-B District Court, East Lansing, Michigan; and Judge Thomas Yeotis, 7th Judicial Circuit, Genessee County, Michigan. Court administrators such as Arthur Chettle, Deputy Court Administrator-Region 2, Flint, Michigan; Albert Kirschenbauer and Gordon Grinwis, Clerk and Chief Deputy Clerk respectively, 54-A District Court, Lansing,

Michigan; Howard Hanchett, Clerk, 66th District Court, Corunna, Michigan; and Bailiff Lofton Carlton, 7th Judicial Circuit, Genessee County, Michigan, aided us in scheduling times for the research and involving jurors. We would also like to thank Mr. Steven Brown, Attorney, Kalamazoo, Michigan, for the valuable assistance he rendered during our research.

In addition to these individuals, we would like to thank the expert directors of our reenacted trials, Mr. Gerry Dahlmann and Dr. Donald Marine, and the excellent casts they assembled. We very much appreciated the assistance of Francis Limmex, Douglas Trusell, John Barrie, and Lynn Beavis for contributing to the design and conduct of the research in a variety of ways.

Over the course of four years, nineteen different individuals from the Department of Communication at Michigan State University have served on our research team. While their names are too numerous to mention here, we sincerely appreciate the substantial contributions they have made to the research. We have also had numerous secretaries who have made significant contributions. Again, their names are too numerous to mention. However, Mrs. Sherry Carman merits special recognition. Her performance while a member of the research team was exceptional.

Finally, our grant coordinator, Dr. Arthur Konopka, has provided useful criticism, guidance, and support. We would like to thank him for his critical and supportive qualities.

INTRODUCTION

The atmosphere in the Department of Communication, particularly one devoted to the development and testing of communication theory, encourages almost endless discussions of situations in which such development and testing can be brought to bear. In dead academic seriousness or in informal interactions, members of the Department relentlessly pick things apart to see how they work.

It was in this atmosphere four years ago that the original members of the legal communication research team assembled the first proposal to evaluate the effects of videotaped testimony on juror information processing and decision-making activities in jury trials. Our curiosity about the use of videotape in the legal system was parented by a number of factors: the opportunity the project afforded to test certain communication theories in a "real world" context; our observations, in other studies dealing at least peripherally with the legal system, that communication within was often handicapped by language and procedure; and the increasing use of video technology in education, in government -- in almost any environment which had the need to improve their information processing capabilities through the use of audio-visual media. Our preliminary investigation indicated that although courtroom use of videotape was transpiring in many different areas of the country, no thorough evaluation had been undertaken to allow legal policy-makers to set standards for its use. Thus we embarked upon this project, which has taken four years to complete. When we initially started, videotape usage in the courtroom was variously viewed as a gimmick, a devious way to replace court reporters, and an ominous portent of a legal electronic circus. Wading laboriously through opinions, accusations, and claims, we arrived at the questions that would be most useful to answer concerning the use of this technology:

I. Does the mode of presentation -- live or videotaped -- influence jurors' information and decision-making behaviors?

II. Does the mode of presentation -- live, color videotape, or monochromatic videotape -- affect jurors' information retention over time?

III. What are the effects of introducing segments of videotaped testimony into an otherwise live trial?

IV. What are the effects of the deletion of inadmissible testimony on individual juror verdicts, individual juror preceptions of attorney credibility, and verdicts of six-person juries?

V. What are the effects of various editing techniques used to delete inadmissible evidence or testimony from videotaped presentations on juror information processing and decision-making activities?

VI. What are the effects of paralinguistic and nonverbal cues on jurors' evaluations of witness demeanor, credibility, and veracity of testimony presented?

VII. What are the effects of certain videotape production techniques on juror verdicts and perceptions of trial participants?

We have attempted in this report to provide a complete overview of the findings from all four years of research. Unfortunately, we are not able to include detailed reports for the studies executed during the first two years of our research. Had we adopted this course of action, the length of this report would have exceeded 500 pages and resources are simply not available to print a manuscript that size. Moreover, a detailed report concerning the first two years of research has already been widely disseminated.

After careful consideration, we decided to develop a report which contains an executive summary of the entire four years of research. While we have included methodological and statistical discussions when appropriate in previous reports, we have elected to avoid all discussions of this nature in the executive summary. Our purpose of avoiding this social science argot is to maximize the comprehensibility of our findings for the very diverse audiences who have solicited information concerning our research. The second section of this report contains detailed presentations of studies completed during the last two years of our research. These presentations include methodological and statistical discussions when appropriate. Hopefully, the adoption of this course of action has produced a report that will be of maximum utility to both the legal and social science communities.

The four years of research have been intellectually exciting and satisfying even though two of the experiments, one during the first grant and one during the second, were adversely affected by perplexing methodological problems. In both situations, we carefully analyzed the problems, solved them, and executed the studies again. Our overall findings suggest no reason that would preclude the use of videotape in the courtroom environment although specific findings do indicate the need for specific rules governing the use of the type of videotape used, monochromatic or color; the type of editing techniques employed to delete inadmissible testimony and evidence; and the type of camera shots used to record testimony of different types of witnesses.

Even though juror information processing and perceptions of trial participants were systematically influenced by the aforementioned factors, it should be noted that jurors' verdicts and final awards were not systematically affected by the use of video technology. Consequently, team members have shut down the cameras, turned off the lights, and have submitted their evidence for you to judge.

EXECUTIVE SUMMARY

It is estimated that more than ten million civil petitions are filed annually in state courts alone. Faced with such problems as crowded dockets, unavailable witnesses, dissatisfied jurors, and increasing court costs, members of our legal system have expressed a growing and continuing interest in the use of videotape technology in trial proceedings. In several states, videotaped testimony has been used extensively in civil cases, and although not as yet widespread, entire civil and criminal cases have been videotaped for presentation to juries. Moreover, an expanding cadre of jurists and other members of the legal profession have endorsed the use of videotape in trial proceedings (e.g., Morrill, 1970; McCrystal, 1971, 1972, 1973; Murray, Jr., 1972).

As the interest of members of the legal system in the use of videotape has burgeoned, there has been a corresponding surge of activity by social scientists seeking to develop and carry out research projects aimed at assessing the possible impact of videotape technology on trial proceedings. The Michigan State University Research Team has been conducting research in this area for approximately four years. The research findings presented in this executive summary hopefully will assist jurists charged with modifying our legal system in avoiding two potential pitfalls of equal gravity: the failure to adopt more just legal procedures and the adoption of, or retention of, less just legal procedures.

Proponents of the use of video technology have advanced the following arguments for its use:

1. Optimal courtroom efficiency is achieved via trial flow without interruption which greatly reduces required trial time and effectively decreases docket overload.

2. Recorded depositions provide ready, convenient access both to the court and to witnesses who are physically incapable of appearing or geographically far removed from the trial location.

3. Maximum use and economy of juror time is accomplished by eliminating bench conferences, chamber retreats, recess time, cases settled before (or after) the in-progress-trial is complete, and cases rescheduled after jurors appear.

4. Deletion of inadmissible evidence obviates the dubious assumption that jurors can disregard such testimony and may also substantially affect trial outcomes.

5. Taping permits continuous, comprehensive viewing of the entire case by both judge and jury.

6. Greater flexibility and more efficient use of time is achieved for judge and counsel who need not be present during the viewing by jurors and who may conduct simultaneous trials.

7. Videotapes provide a complete record of trial proceedings that may be used during the appeal process.

After examining arguments of this nature, opinions, accusations, and claims concerning the potential impact of video technology upon the legal system, we constructed a series of research questions we wanted to answer about this technology: Did its use or its nature modify the information it was transmitting in the eyes of those who must absorb the information, namely jurors? If so, how? More specifically, might such factors as verdict or retention of trial-related information be affected by the use of videotape? A series of studies was designed and executed to provide answers to such questions.

In its broadest sense, the research examined the behavioral effects of using video technology in courtroom trial situations. Specifically, the following research questions were addressed:

I. Does the mode of presentation -- live or videotaped -- influence jurors' information processing and decision-making behaviors?

II. Does the mode of presentation -- live, color videotape, or monochromatic videotape -- affect jurors' information retention over time?

III. What are the effects of introducing segments of videotaped testimony into an otherwise live trial?

IV. What are the effects of the deletion of inadmissible testimony on individual juror verdicts, individual juror perceptions of attorney credibility, and verdicts of six-person juries?

V. What are the effects of various editing techniques used to delete inadmissible evidence or testimony from videotaped presentations on juror information processing and decision-making activities?

VI. What are the effects of paralinguistic and nonverbal cues on jurors' evaluations of witness demeanor, credibility, and veracity of testimony presented?

VII. What are the effects of certain videotape production techniques on juror verdicts and perceptions of trial participants?

The studies germane to each of these research questions will be discussed in turn and the results will be presented.

Two general methodological issues require comment before proceeding. First, our research has employed simulations of trial proceedings which attempt to maximize realism. With a few exceptions, the simulations utilized actual jurors viewing real cases in the presence of professional judges. In most instances, the jurors believed they were about to deliberate and deliver a binding decision. These realistic simulations were adopted to increase the validity and generalizability of our findings.

Second, most of the research reported here focuses upon the effects of the videotape medium on information processing and decision-making cognitions of individual jurors prior to deliberation. This procedure was used so as to observe the uncontaminated effects of the video presentation which might be confounded and modified during deliberation. While we are aware of the importance of group process variables, jurors do bring an initial aggregate of information, perceptions, and attitudes into the deliberation room which accrue from the trial presentation and may affect its ultimate outcome. One study that focuses upon the deliberation process itself will be discussed.

Because of the programmatic and cumulative nature of this research, some desirable overlapping of foci across studies is evident. Our discussion of each focus will entail a brief conceptual discussion of the research area, discussion of the research questions addressed, a brief, non-technical overview of research procedures employed, and a terse summary of relevant findings.

Question I: Does the mode of presentation -- live or videotaped -- influence jurors' information and decision-making behaviors?

Although we had no single set of rigorously derived theoretical expectations concerning what differences, if any, to expect in juror response to live and videotaped trials, several lines of thinking suggested that it would be useful and interesting to examine this question. At a very global level, the writings of people such as Marshall McLuhan (1964) stress the hegemony of the medium itself as the primary message in communication transactions: McLuhan argues that the medium has a pervasive influence on the way we process information and the perceptions we develop of the external world. To be sure, most of his insights concern potential differences between alternative media -- e.g., print versus television -- rather than possible variations in media-mediated as opposed to directly experienced events. Still, his ideas are provocative and do suggest that the addition of any intervening medium to a communication transaction might have some impact on the way information is processed and judgments are formed.

At a less abstract level, the complexity of the stimulus field to which jurors are exposed is drastically reduced by the use of videotape. During a live trial, the juror may be attending to the verbal and nonverbal behaviors of the witness, the facial expressions of the judge or defendant, a conversation between one of the attorneys and his client, the murmured remarks of spectators, or a host of other stimuli. Although we attempted to develop a taping system that would capture much of this detail and richness, it seems apparent that with the use of video technology, some reduction in the stimulus field of jurors is inevitable.

The major problem, however, lies in specifying the extent and direction of differences, if any, that might occur in juror responses to live and videotaped trials. Suppose, for example, that we are correct in assuming that the complexity of the jurors' stimulus field is reduced when videotape is used. How might such factors as the verdict itself, the amount of information the jurors retain, their perceptions of the trial participants, and their interest and motivation in serving as jurors be influenced by this reduction? It seemed to us that plausible arguments could be made for either, or several, possible opposing outcomes. Consider, for instance, the question of information retention. At first glance, it may appear that restriction of the stimulus field should facilitate juror retention of information. From a distraction viewpoint, this assumption is warranted. The many competing stimuli present in a live trial may distract jurors from the testimony of witnesses, the questions of attorneys, or the rulings of the judge, thus reducing the amount of information retained. To the extent that this occurs, elimination of these distracting stimuli by means of videotape should result in better retention of information by jurors.

But consider the other side of the coin. From a motivational standpoint, it is possible that the rich milieu of the live trial is better calculated to hold jurors' interest. Extensive viewing of a videotaped trial may become boring and monotonous, causing jurors' attention to lag. If so, we would anticipate that the live trial would result in better retention of information by jurors.

Because of the numerous possible conflicting predictions that we might have generated, the study was questioned-centered rather than hypothesis-centered. Specifically, we investigated the following major questions:

1. Are there differences in attributions of negligence between jurors exposed to a live trial and jurors exposed to a videotaped trial?

2. Are there differences in the amount of award between jurors exposed to a live trial and jurors exposed to a videotaped trial?

3. Are there differences in perceptions of attorney credibility between jurors exposed to a live trial and jurors exposed to a videotaped trial?

4. Are there differences in retention of trial-related information between jurors exposed to a live trial and jurors exposed to a videotaped trial?

5. Are there differences in motivation and interest between jurors exposed to a live trial and jurors exposed to a videotaped trial?

To enhance the probable validity and generalizability of our findings, an actual trial transcript, Clark v. Nugent, was selected with the assistance of legal experts. The trial dealt with an automobile injury case involving alleged contributory negligence by the plaintiff. For the most part, the content and structure of the trial transcript were left unchanged. There were, however, three areas where some editorial discretion was exercised. First, the names of all participants in the trial were changed and Anglicized, both to protect the identity of the original participants and to avoid any possible juror bias resulting from ethnic names. Second, certain details of the trial were altered to conform with the date of reenactment and to facilitate procurement of visual exhibits. Finally, the dialogue was edited to eliminate some of the testimony objected to by the opposing attorneys in the original trial so as to ensure an equal number of objections by both attorneys.

Fifty-two jurors from the Genesee County Circuit Court (Flint, Michigan) viewed a live reenactment of the trial. Two taping systems were unobtrusively positioned in the courtroom, one employing a triple camera, split-screen technique, the other relying on a single camera, full-screen projection. The major difference between the two systems resides in the amount of detail that can be captured by each. The full-screen system has the advantage of providing a realistic shot of the entire trial area, yet technical limitations prevent close-up views of trial participants, particularly where panning and zooming are prohibited.

By contrast, the triple camera, split-screen system allows the juror to study idiosyncratic responses of participants in greater detail by providing a close-up view of the witness in the upper left quarter of the screen, a close-up view of the questioning attorney in the upper right quadrant, and a panoramic view of the courtroom in the lower half of the screen. The greatest potential disadvantage of the split-screen projection is its lack of realism since it relies on technology to create a more visible, yet less "natural" product. The two systems were compared in a production technique study discussed later in this summary.

The presiding judge in the live trial explained to the jurors that the abnormally large jury was being used to permit the conduct of research focusing upon the effects of jury size. He also explained that the videotape recording cameras in the courtroom were for the purpose of making a record of the trial for possible later appeal or review. (All technical personnel and control equipment were located in the judge's chambers outside the view of the jurors.) At the conclusion of the trial, jurors were escorted to the jury room where a "jury size" questionnaire was administered.

One month later, forty-five jurors from Genesee County viewed the split-screen videotape version of the trial. The only difference from the live presentation was that jurors viewed the trial on six television monitors in the same courtroom. The judge's preliminary instructions addressed this difference and advised jurors that the televised trial was fully as important as a live trial and the decisions they reached would be binding upon the litigants. The "jury size" questionnaire was again administered at the conclusion of the trial in the jury room.

Analysis of the data collected from both groups of jurors produced the following findings:

1. The mode of presentation did not significantly influence juror attributions of negligence.
2. The mode of presentation did not significantly affect the amount of money awarded by jurors who found for the plaintiffs.
3. The mode of presentation did not significantly affect juror perceptions of attorney credibility.
4. The mode of presentation did not significantly affect juror retention of trial-related information.
5. The mode of presentation did not significantly affect juror interest or motivation in the trial.

Thus, this study produced no evidence that the videotape format results in detrimental effects on juror response. As compared to their counterparts who observed the live trial, jurors who viewed the videotaped version rendered similar judgements of negligence and amount of award, reported comparable perceptions of opposing attorneys, retained as much trial-related information, and reported similar levels of interest and motivation toward their task of jury service. Absence of differences in ratings of attorney credibility may provide some reassurance for lawyers who fear a potential loss of courtroom effectiveness with the adoption of videotaped trials.

Question II: Does the mode of presentation -- live, color videotape, or monochromatic videotape -- affect jurors' information retention over time?

Two studies examined the potential impact of videotaped testimony on juror retention of trial-related information. Concern with information retention emanates from the judicial premise that verdicts should be based upon the facts and evidence of the case, not on extraneous factors. The research reported upon here specifically addressed the following two questions:

1. Are there differences in the amount or pattern of trial-related information retained by jurors exposed to live testimony as opposed to videotaped testimony?

2. Are there differences in the amount or pattern of trial-related information retained by jurors exposed to monochromatic videotaped testimony as opposed to color videotaped testimony?

Even though overall scores on information retention might possibly be nearly the same (as in the case of the live trial vs. videotaped trial study first described), the pattern of information retention for jurors viewing live, color, and black-and-white modes of presentation may differ at different times during the trial as a function of the "richness" of information in a presentation. Richer presentations may produce different levels and patterns of interest than presentations that contain less information.

Research by Miller and Campbell (1959) suggests that if people are interested in a presentation, they will remember the last portion of the message to a greater extent than the first part. Conversely, if a presentation is uninteresting, recall of the first part will be better than recall of later segments, presumably because listeners tune later sections out. This effect might occur when we present trials to jurors in the various modes. If the live presentation results in more personal involvement for jurors than does the videotape, we would expect jurors viewing a live trial to remember earlier events to a greater extent. Similarly, if color television is more "life-like" than black-and-white, retention patterns should differ between the two modes. This possibility is supported by Kumata (1960) and Katzman (1971) who report dissimilar patterns of information processing for black-and-white and color television. Schaps and Guest (1968) also found that research participants watching color television had better recall of advertisements than those who viewed commercials presented in the black-and-white mode.

Consequently, we might expect jurors serving in live trials to retain information presented near the end of a trial to a greater extent than jurors who view a trial on color or black-and-white videotape. Conversely, jurors who view a trial on monochromatic tape should have a better recall of material given at the outset of a trial than jurors who view the same trial on color videotape or live.

An actual trial transcript concerning a contested will was selected with the assistance of legal experts. The trial was reenacted in the presence of 31 jurors from the 65th District Court (Flint, Michigan) who were told by the presiding judge that they would be viewing an actual trial. To justify the large jury, jurors were informed that the litigants had agreed to participate in a jury size study and that the trial would be halted periodically in order to administer questionnaires.

The live trial was videotaped in the courtroom while it was in progress. A questionnaire designed to measure retention of trial testimony was administered. The relevant segment of the trial consisted of 52 minutes of testimony by only one witness and was chosen to avoid confounding effects on test results stemming from different delivery styles and credibility levels of two or more witnesses. Jurors completed the questionnaire believing that the trial would resume when they were finished. They were then debriefed and dismissed.

The videotaped trial was shown in color and black-and-white respectively to two different groups of 31 (65th District) jurors. The presiding judge informed the jurors that they would be viewing a videotaped trial in which both litigants had agreed to accept the judgment of the jury.

In constructing the information retention measure, the 52 minute segment of testimony was divided into four, 13 minute parts. An equal number of recall items was drawn from each interval so that the pattern of retention could be observed across equal time periods. Information retention from corresponding 13 minute segments was compared across live, color, and black-and-white presentations. Analyses were also performed within each mode of presentation to determine whether the three methods varied on patterns of retention across the four time intervals. Jurors were also asked to rate the credibility of both attorneys.

Analysis of the data collected from the three groups of jurors produced the following findings:

1. Retention of trial-related information for all three presentations was highest for the first 13 minute interval.
2. Information retention declined significantly over time in all modes of presentation.
3. A more rapid decline in retention occurred for jurors who viewed the live trial.
4. Jurors in the two videotaped presentations retained more information from later segments of the testimony, with retention somewhat greater in the black-and-white medium.
5. While retention patterns differed across the three modes, absolute differences in mean (average) retention scores were not large.
6. The mode of presentation did not significantly affect juror perceptions of attorney credibility.

These findings indicate that as the amount of viewing time increases, videotaped testimony apparently results in greater retention of trial-related information, suggesting that videotape may better hold juror attention. Moreover, this effect is somewhat more pronounced for black-and-white than for colored tape. Even though the absolute differences in mean retention scores were not large, the fact that relatively small mean differences produced statistically significant results indicates that the observed effect was remarkably consistent for jurors in a given presentational mode. To the extent that observed differences persist over longer time periods, the cumulative effect of a videotaped presentation on juror information retention could be substantial in a lengthy trial.

The absence of significant differences in this study comports with findings from the first study which again may provide reassurance for lawyers who fear a potential loss of courtroom effectiveness with the adoption of videotaped trials.

An additional study was conducted to examine with greater specificity the potential differences in retention of trial-related information between jurors exposed to color as opposed to black-and-white presentations. Besides varying the mode of presentation, the delivery characteristics of the testifying witness were also varied so as to determine whether juror response to the two modes of presentation is influenced by the communicative skills of particular witnesses.

The stimulus employed was a videotaped recording of a deposition concerning an industrial accident. A professional actor role-played the witness, and attorney roles were played by professional lawyers. Manipulation of the witnesses' testimony was accomplished by requiring the same actor to play two different roles: (1) a strong witness who was assertive, attentive, and unhesitant when giving testimony; and (2) a weak witness who exhibited verbal and nonverbal cues suggesting uncertainty, inattention, and hesitancy. The testimony presented was identical in each condition except for paralinguistic and nonverbal cues.

A representative adult sample (approximating the typical jury panel) of 198 paid volunteers from the Lansing, Michigan, area served as jurors and were randomly assigned to one of four experimental conditions. Each juror group viewed the testimony of one witness type, strong or weak, in either the color or black-and-white medium. After viewing the taped deposition, jurors completed a questionnaire designed to measure information retention and perceptions of witness credibility. Analysis of the data revealed the following findings:

1. Information retention scores for both witness types were higher in the black-and-white than in the color presentation.
2. Jurors who viewed the strong witness type retained significantly more information than their counterparts exposed to the weak witness.
3. The strong witness was perceived as significantly more credible than the weak witness.
4. The color presentation produced significantly higher ratings of perceived witness credibility which was particularly apparent for the strong witness.

The most potentially important finding from this study is that jurors remember more trial-related information when it is presented on black-and-white videotape. This supports our previous finding. However, the findings concerning the perceived credibility of a witness pose an interesting paradox; namely, one medium apparently maximizes retention of trial-related information while the other maximizes the perceived credibility of testifying witnesses.

Question III: What are the effects of introducing segments of videotaped testimony into an otherwise live trial?

The studies discussed thus far have focused upon the unilateral use of three different modes of presentation: live, color videotape, or monochromatic videotape. There are situations where mixing these modes -- i.e., interspersing videotaped testimony, such as a deposition, into an otherwise live trial -- might be desirable.

A particularly pressing problem related to court scheduling is the unavailable witness, e.g., one who is geographically removed from the trial setting or one whose professional commitments render it difficult to free up time to testify. An increasingly widespread practice in this situation is to record the testimony on videotape. The utility of videotape as a solution to the problem of unavailable witnesses hinges upon its ability to present testimony without producing biasing effects.

Mass media researchers have long recognized the status-conferral function of the media (Lazarsfeld & Merton, 1952). Considerable research indicates that television is the most credible mass medium. Unfortunately, there are no data bearing on the extent to which the credibility of television _per se_ transfers to witnesses whose testimony is televised in courtrooms. Possibly the use of videotaped testimony may introduce a facilitative effect where the credibility of the medium itself is added to the credibility of the witness. If so, segments of videotaped testimony of witnesses shown in an otherwise live trial could have a disproportionate impact on jurors.

In addition, the attention of jurors during the trial and their subsequent retention of information may be influenced by this mode of presentation. Videotaped testimony in live trials is presently novel for most jurors. This novelty could result in greater juror interest, thus increasing the importance of the testimony in jurors' decision-making.

In conjunction with these potentially biasing effects, it should be recognized that the videotape medium has the capacity to preserve paralinguistic and nonverbal behaviors of the witness which are lost when a written deposition is presented.

Broadly conceived, this study focuses upon two issues. First, how do individual jurors form impressions during the course of the trial, and second, how are these individual impressions transformed into a group decision, the verdict of the jury? Relative to these general concerns, the present study was designed to specifically examine:

1. The effects of live versus videotaped witness presentation on juror pre-deliberation award, juror retention of trial-related information, and juror perceptions of source credibility;

2. other variables influencing individual juror pre-deliberation award;

3. salient factors affecting the translation of individual pre-deliberation award into a group decision, i.e., the jury award; and,

4. variables predicting individual juror, post-deliberation award.

This study relied upon the use of four treatment groups in which the medium of presentation for two expert trial witnesses varied. In one condition, both expert witnesses testified live under normal court conditions. In a second condition, the testimony of both witnesses was presented to jurors on monochromatic videotape. In a third condition, the expert witness called by the plaintiff testified live while the testimony of the expert witness called by the defense was shown to jurors on monochromatic videotape. In the final experimental condition, the testimony of the plaintiff's expert witness was presented to jurors on monochromatic videotape while the defense's expert witness testified live.

One hundred and six jurors, drawn from the jury pool of the 68th District Court in Flint, Michigan, were randomly assigned to the four experimental conditions. The trial simulation presented in the courtroom involved a civil litigation contending the extent of the defendant's liability for personal injury. Consequently, juror judgments in this case dealt exclusively with the question of monetary award to the plaintiff.

The presiding judge explained (in the appropriate experimental condition) that because of a change of venue, the witness/witnesses could not be present, and consequently, videotaped testimony would be presented in his/their place. The judge also justified the presence of an unusual number of jurors in terms of research being conducted by the National Science Foundation on jury size. Following presentation of the trial, jurors were divided into six-person jury panels, assigned to separate jury rooms, and instructed to deliberate the case. Jurors were assured by the judge that the consensus of verdicts rendered by the several jury panels would be binding upon the litigants.

Three measuring instruments were administered to jurors during the course of the experiment: (1) a questionnaire measuring demographic information; (2) a questionnaire measuring several types of award judgment, confidence in award judgments, trial-related information retention, five dimensions of source credibility, and the salience of trial issues favoring either the plaintiff or defendant; and (3) a questionnaire containing post-deliberation measures of award and certainty, personality characteristics of jurors, and evaluations of self and other group members as jurors.

Finally, during the deliberations, observations were made of each jury to record: the group award, length of deliberation time, elected foreperson, task-oriented statements, and remarks questioning the authenticity of the trial. Analysis of the data produced the following results:

1. The mode of presentation did affect pre-deliberation award.
2. The mode of presentation did affect juror information retention.
3. The mode of presentation did affect jurors' perceptions of trial participants' credibility.
4. The best predictor of pre-deliberation awards was juror perceptions of whom the relevant issues favored in the case.
5. Jury award was significantly influenced by the individual juror's initial evaluation of the case and the jury foreperson.

While the mode of presenting expert witnesses does affect pre-deliberation award, information retention, and perceived witness credibility, the nature of these effects is quite complex. Specifically, the plaintiff's witness was more effective in obtaining favorable awards when he appeared live while the defendant's witness was more effective in reducing the award (advantaging the defendant) when he appeared on videotape. The most plausible explanation for this difference concerns variations in the communicative skills of the two witnesses across presentational modes. The plaintiff's witness appears to have "come across" more effectively when testifying live, while the defendant's witness was apparently more persuasive on videotape. Thus, the result does not bear directly on the mode of presentation, but rather on differences among persons in using the two modes effectively.

Jurors retained more of the testimony by the plaintiff's witness in the live condition, whereas mode of presentation did not exert a significant influence on juror retention of testimony by the defendant's witness. Additionally, both the plaintiff and the plaintiff's witness were perceived as considerably more credible when the plaintiff's witness was presented live. However, similar results were not obtained from credibility measures on the other three trial participants examined. In short, the obtained credibility effects are in the opposite direction than expected, and they are also inconsistent across trial participants. These data further reinforce the conclusion that different sources have characteristics which are perceived differently depending upon the mode by which the trial participant is presented.

Although the mode of presentation had a statistically significant effect on pre-deliberation award, the effect was relatively small. Encouragingly, the best predictor of pre-deliberation award was juror perceptions of whom the relevant issues in the case favored. Which variables allow one to predict how jurors will perceive issue relevancy is a question for future research.

Jury award was predicted well by two factors: (1) the individual's initial evaluation of the case, indicated by a high correlation between individual pre-deliberation award and the jury award; and (2) a social influence factor, indicated by the high correlation between foreperson award and the award of the jury. This finding indicates that jury forepersons are highly influential jury members, as previous research suggests (Strodtbeck, James & Hawkins, 1957).

Post-deliberation award was primarily affected by two factors: (1) the individual juror's initial evaluation of the case; and (2) the persuasion process occurring in the context of jury deliberation. This relationship was indicated by a high correlation between jury award and the individual post-deliberation judgment.

Finally, the impact of individual differences on these data is clearly evident. Since the present study was not designed to expose the nature of these differences, subsequent research should address this problem area.

Question IV: What are the effects of the deletion of inadmissible testimony on individual juror verdicts, individual juror perceptions of attorney credibility, and verdicts of six-person juries?

Use of videotape in the courtroom allows legally inadmissible testimony to be edited from the trial before jurors are exposed to it, thus reducing the trial time, affording judges an opportunity to research questions of inadmissibility before their ruling, and circumventing the potential impact of inadmissible evidence on jury verdicts.

The prospect of cliental advantage encourages some attorneys to knowingly introduce inadmissible evidence in violation of trial procedure. Trial procedure can be viewed as a set of rules governing the courtroom behavior of trial participants. These rules are complex and have been developed through an ongoing process of trial and error. The rules governing the introduction of evidence are especially important, for it is on the basis of evidence that juries and judges are supposed to make determinations of fact and ultimately to reach verdicts.

Various aspects of trial procedure have been studied by legal practitioners and social scientists since at least the turn of the century. Because of their importance, substantial attention has been devoted to the rules of evidence. One specific concern emanates from the potential effects of infractions of evidentiary rules upon jurors with emphasis on whether jurors can disregard such evidence when directed to do so.

Research regarding the effects of jurors' knowledge of a defendant's "character" (Landy & Aronson, 1969; Nemeth & Sosis, 1970, 1973; Mitchell & Byrne, 1973; Dowdle, Gillen & Miller, 1974) as well as research on the effects of pre-trial publicity (Tans & Chaffee, 1966; Simon, 1966; Hoiberg & Stires, 1973; Padawer-Singer & Barton, 1975) has established that there are classes of information that are not normally admissable and that can alter significantly trial outcomes.

Research assessing the general effectiveness of judges' instructions (Hunter, 1935; Hervey, 1947; Simon, 1967, as interpreted by Erlander 1970) has found that instructions are generally neither well understood or not followed.

Taken together, these two sets of findings support the expectation that the introduction of objectionable evidence should have a significant impact upon trial outcomes, judges' instructions notwithstanding. Nevertheless, examination of research which specifically focuses upon this issue does not yield strong support for this expectation.

Wanamaker (1937) found that jurors responding to a questionnaire had discussed issues during deliberation that by law should not have been discussed. His findings, however, did not demonstrate that these discussions altered trial outcomes.

Weld and Danzig (1940) exposed two juries composed of persons known to have anti-Nazi sentiments to information indicating that an individual in a trial reenactment had pro-Nazi sympathies. Only one person mentioned this information during deliberation, and he was reminded by another juror of the judge's instructions to disregard the information. This study, however, included only two juries, far too few to permit meaningful inferences. Furthermore, the objectionable evidence was not very important within the trial context which dealt with civil fraud.

Hoffman and Brodley (1952) interviewed 18 jurors after three trials in which objectionable testimony was introduced. Only one juror remembered that the evidence was not to be considered. Again, however, too few cases were investigated to permit justifiable inferences. Likewise, the researchers were unable to demonstrate that consideration of the evidence had any influence on trial outcomes.

Broeder (1959) reports an experiment, conducted as part of the University of Chicago Jury Project, in which 30 mock juries were exposed to one of three versions of an automobile liability case. When the defendant disclosed that he had no liability insurance the average award among jurors was $33,000; when he disclosed that he had liability insurance the average award increased to $37,000; and when the jury was told to disregard the information that he had liability insurance, the award increased to $46,000. Although no statistical analysis of these data is provided, the observed differences seem large enough to warrant an assumption of reliability. The fascinating aspect of this study is, of course, its finding that the objection and subsequent instructions to disregard the objectionable testimony appear to have increased the testimony's impact.

Kline and Jess (1966) exposed four juries to prejudicial pretrial publicity. During deliberation the evidence was mentioned in all four juries. In three of the juries the person mentioning the information was reminded of the judge's instruction to disregard the information, and it was not mentioned again. In the fourth jury the information was actively used in reaching a verdict. Again, the small sample size renders the drawing of inferences hazardous.

Simon (1966) reports that when explicitly told to disregard prejudicial information from sensationalistic newspaper accounts, jurors who read such accounts return no more guilty verdicts than do jurors who read less sensationalistic accounts. Sue, Smith, and Caldwell (1973) note, however, that the evidence introduced was not clearly important to the trial, and since it was from a newspaper it might be easier to disregard than evidence heard during the trial itself.

Mitchell and Byrne (1972) detected no differences in verdicts between persons reading a transcript in which the judge instructed them to pay special attention to certain information and one in which he directed them to disregard it. They conclude that the instructions had no effect. In a similar vein, Sue, Smith, and Caldwell (1973) had students read one-page summaries of a trial in which a single instance of objectionable testimony was introduced. An objection to this evidence was either sustained or overruled and a control condition was included which contained no objectionable evidence. The researchers found that if the other information against the defendant was weak, the objection resulted in significantly more convictions regardless of the judge's instructions. Both of these studies involved subjects reading brief transcripts or summaries of trials, and the extent to which one can generalize from such research to actual courtroom situations is questionable.

The research on objectionable evidence is thus characterized by small sample sizes, findings of no difference, and inconclusive results. Nonetheless, it seems reasonable to conclude that: (1) under at least some circumstances, objectionable evidence will significantly affect trial outcomes; and (2) objections and/or directions to disregard evidence sometimes increase its impact.

If inadmissible evidence does significantly influence juror information processing and decision-making behavior, the argument for the use of videotape as a means of ensuring that jurors are not exposed to testimony or evidence that is ruled inadmissible has merit. Given the limitations associated with some of the previous research discussed, several studies more congruent with the actual courtroom process were executed.

The first study focused upon the cumulative effects of increasing instances of inadmissible testimony upon individual juror perceptions of attorneys, verdicts, and awards in a civil trial. The second study was a modified replication of the first while the third study investigated whether or not jurors discuss inadmissible evidence during their deliberation proceedings, and if so, whether the discussions influence verdicts rendered.

During our initial planning of this line of research, we contemplated varying numerous aspects of the introduction of inadmissible material: the number and ratio of such materials introduced by the attorneys, the number and ratio of objections sustained or overruled by the judge, etc. Both time and financial resources prohibited such an ambitious scheme. Consequently, we were constrained to a modest exploration of the potential impact of inadmissible testimony upon jurors.

Although actual trial transcripts were used in the preparation of videotaped trial stimuli for all three studies, it was necessary to control experimentally both the amount of inadmissible material introduced and the attorney responsible for its introduction. Exercising this control facilitated isolating the effects of varying amounts of inadmissible testimony upon juror decisions and their perceptions of the attorney responsible for its introduction.

Two criteria were used to prepare inadmissible materials. First, they should lend themselves to believable, "natural" insertions into the transcripts, and second, the psychological impact of each instance on jurors should be roughly comparable. The first criterion was easier to satisfy than the second. Unfortunately, we know of no foolproof way to assure that each instance of inadmissible material will have an equal psychological impact upon jurors. In making our choices, we were guided by the advice of legal consultants and by some pretesting of items on students and colleagues. However, we were never confident that the inadmissible evidence introduced within each of our stimulus trials was of equal psychological potency.

As mentioned earlier, the prospect of cliental advantage encourages some attorneys to knowingly introduce inadmissible evidence. When courtroom rules are extensively violated by an attorney, then one or both of two contingencies might be predicted. Jurors might perceive the rule-breaking attorney as having knowingly and intentionally broken the rules, in which case s/he would be perceived as less trustworthy. In such cases, jurors might react unfavorably to the attorney's client. Alternatively, jurors might perceive the rule-breaking attorney as ignorant of the rules of trial procedure and thus generally less competent. In such instances, jurors might feel some measure of sympathy for the attorney's client and react more favorably toward the client's case.

Since the preceding hypothetical analysis involves a number of complex, competing relationships, specific hypotheses were not tested. Rather, the first study was questioned-oriented and addressed the following issues:

1. Are there differences in attribution of negligence among jurors exposed to varying amounts of inadmissible testimony in a trial?
2. Among jurors finding for the plaintiff, are there differences in the amounts of award among those jurors who have been exposed to varying amounts of inadmissible testimony?
3. Are there differences in perceptions of attorney credibility among jurors who have been exposed to varying amounts of inadmissible testimony?

The Clark v. Nugent trial discussed earlier served as the stimulus trial in this study. As mentioned earlier, in preparation for this research the original trial dialogue was edited to eliminate some of the testimony objected to by the opposing attorneys to ensure an equal number of objections by both attorneys. In consultation with legal experts, we edited the trial dialogue to eliminate inadmissible material not actually contested in the original trial and to equalize the number of objections by both attorneys. The edited transcript contained six objections by each of the attorneys, two of which were sustained by the judge and four of which were overruled. For each attorney, four of the objections concerned substantive matters, i.e., matters relating to the introduction of facts or opinions as evidence in the case; and two concerned procedural matters, i.e., matters relating to errors in trial procedure. This equalizing procedure made it possible to keep the merits of the two cases and the behavior of the two attorneys relatively comparable and to establish an identical baseline for the insertion of additional inadmissible material.

Working with legal consultants, we constructed six additional instances of substantively objectionable material. These instances were all parts of the case for the two plaintiffs, i.e., they were introduced by the content of questions asked by the plaintiffs' attorney, or elicited from witnesses as a result of questioning by the plaintiffs' attorney.

The six instances of inadmissible material were appropriately inserted into the original edited transcript, thus enabling us to create differing versions of the trial by editing out various numbers of them. Seven different versions were created containing from zero to six instances of inadmissible testimony. One hundred and twenty jurors from the Wayne County Circuit Court (Detroit, Michigan) participated in the study and were told that they would be serving in trials involving change of venue. They were also informed that a representative from Michigan State University would administer a questionnaire on jury size after the trial and prior to their deliberation.

Analysis of the data, collected from the seven groups of jurors viewing the trial containing either zero, one, two, three, four, five, or six instances of inadmissible testimony, yielded the following findings:

1. The amount of inadmissible evidence did not significantly influence juror attributions of negligence.
2. The amount of inadmissible evidence did not significantly affect the award judgments of jurors finding for the plaintiffs.
3. The amount of inadmissible evidence did not significantly affect juror perceptions of the credibility of the plaintiffs' attorney.
4. The amount of inadmissible evidence did not significantly affect juror perceptions of the credibility of the defendant's attorney.

The study failed to isolate any effects of inadmissible testimony. No significant differences in attribution of negligence resulted from varying the amounts of inadmissible material in the trial. Similarly, no differences were found in the amount of money awarded to the plaintiffs. Since the plaintiffs' attorney was responsible for introducing the additional inadmissible materials, some change might have been expected in the perceived credibility ratings of the attorney. However, trustworthiness scores and competence ratings (both dimensions of perceived credibility) for the plaintiffs' attorney yielded no significant differences across the seven trial conditions. Similarly, juror ratings of the defense attorney's credibility did not differ significantly as a result of varying the amount of inadmissible testimony to which jurors were exposed.

These results may be attributable to one or more of the following factors. First, effects of the inadmissible testimony may have been relatively small in relation to the length (four and one-half hours) of the trial (cf. Sue, Smith & Caldwell, 1973). Second, the inadmissible evidence may have been either insufficiently supportive of the plaintiffs' case or insufficiently damning to the defendant's case to exert an appreciable effect on verdict, award, or attorney credibility. Third, the large indemnity requested by the plaintiffs may have suppressed differences in juror response to varying amounts of inadmissible testimony. When large petitions are involved, jurors tend to select round figures near either extreme of the allowable range.

Two final factors impaired the study. Because of unexpected juror needs by the court, the number of jurors available to participate in this study was limited, which reduced the power of the statistical tests used to analyze the data. Moreover, this first study depended on single-item differences in inadmissible materials to produce variations in juror response, i.e., the use of seven trial presentations relied on the assumption that each additional instance of inadmissible evidence would exert a measurable impact on juror behavior.

The second study consisted of a modified replication of the first experiment. The three versions of the trial containing zero, three, and six instances of inadmissible testimony were used in this experiment. Due to limitations of the availability of a courtroom and actual impaneled jurors, 144 undergraduate students at Michigan State University role-played jurors. Potential participants responded to advertisements requesting paid assistance in a legal research project, and those who agreed to participate were randomly assigned to one of the three trial presentations.

Participants were told they would be viewing an actual videotaped trial and that their task was to role-play a conscientious juror. They were instructed to assume that their verdict would be binding on the plaintiffs and the defendant.

The results of this study were essentially the same as those for the first study. There was no evidence that the amount of inadmissible testimony affected juror attributions of negligence. Although more jurors found for the defendant, the number did not vary significantly as a function of the amount of inadmissible evidence presented.

Similarly, the data yielded no compelling evidence that the amount of inadmissible testimony influenced award judgments of jurors finding for the plaintiffs. Variations in the amount of the average award were consistent with expectations discussed earlier, i.e., jurors exposed to a moderate amount (three instances) of inadmissible testimony granted a somewhat larger award to the plaintiffs than did jurors exposed to no inadmissible material. Likewise, as anticipated, with the introduction of additional inadmissible evidence (six instances), the amount of award decreased. These differences, however, were not statistically significant.

Finally, juror perceptions of the credibility of the counsel for the plaintiffs did not vary substantially across the three trial versions. The average ratings on this variable corresponded with the pattern observed for the amount of the award: increasing with the introduction of three instances but declining when the input was increased to six instances. Again, these variations were not statistically significant. Credibility ratings for the defendant's attorney were somewhat more stable across trial conditions.

While these first two studies focused upon the effects of inadmissible evidence upon individual juror verdicts, awards, and perceptions of attorney credibility, the third study focused primarily upon the effects of inadmissible material on the deliberation process itself. Specifically, we were interested in determining if jurors disregard inadmissible evidence when instructed to do so by the presiding judge or ignore his/her instructions and discuss the material during deliberation proceedings.

Once again, an actual trial transcript was selected for simulation. The case involved a civil proceeding in which the defendant was accused by a commercial bank of conversion of funds.

The original transcript contained two instances of inadmissible testimony and was an appropriately balanced case, i.e., the evidence was not heavily weighted in favor of either litigant. With the assistance of two attorneys and a judge, four additional instances of inadmissible evidence were constructed and inserted into the trial manuscript to meet an "average" number of objections estimated by legal experts for a trial of its length (one and one-half hours).

Professional actors were recruited to role-play participants in the trial. The judge who originally tried the actual case presided during the reenactment which was videotaped using two different systems. The first system consisted of a fixed, single camera color system that produced a panoramic view of the trial proceedings and the second system (which will be considered in greater detail during our discussion of production techniques) included four monochromatic fixed cameras and a special effects generator.

The full-screen color videotape was used as the stimulus for the study under discussion here. Two different conditions were included in this study: a treatment group in which participants viewed the version of the trial containing all six instances of inadmissible evidence and a control group in which participants viewed a version of the trial containing zero instances of inadmissible material. The following questions were addressed:

1. Do jurors exposed to evidence ruled inadmissible discuss it during deliberation proceedings even though instructed to disregard it?
2. Are there differences in verdicts between juries exposed to a trial containing inadmissible evidence and juries viewing the same trial devoid of inadmissible evidence?
3. Are there differences in verdicts between juries exposed to a trial containing inadmissible evidence and who discuss it during deliberation proceedings and juries exposed to the material but who do not discuss it?

4. Are there differences in certainty of verdicts between jurors exposed to a trial containing inadmissible evidence and jurors viewing the same trial devoid of inadmissible evidence?

5. Are there differences in satisfaction with verdict between jurors exposed to a trial containing inadmissible evidence and jurors viewing the same trial devoid of inadmissible evidence?

Due to the lack of courtroom facilities and the nature of this particular study, it was executed in a conference room in the Department of Communication at Michigan State University. The room was equipped with video recording cameras which were hidden in audio speaker boxes mounted on the walls. This arrangement allowed us to videotape unobtrusively the deliberation proceedings without the knowledge of the jurors.

One hundred and eighty adults from the Lansing area eligible for jury duty were recruited to role-play jurors in this study and were assigned to 30, six-person juries. Fifteen juries were assigned to the control group and 15 to the treatment group. Even though participants were notified well in advance of the evening they would serve on the jury they had been assigned, a few of them contacted us on the day they had agreed to participate and indicated they would be unable to keep their commitment. These last minute cancellations necessitated the use of confederates to maintain an atmosphere of realism for the remaining five jurors who expected to serve on a six-person jury. The actual subjects believed the confederates were participants like themselves. The confederates were instructed to maintain a low profile during the deliberation proceedings so they would not influence deliberation discussions among the jurors nor their verdict votes. In all, seven of the 15 juries in the treatment group and seven in the control group had one confederate in them.

On the evening of their participation, the role-playing jurors reported to the conference room and completed a questionniare containing primarily demographic measures. They viewed the trial and at the beginning of the deliberation proceedings elected a foreperson. The jury foreperson polled the jury via written ballot prior to the deliberations. The confederates voted "undecided" during this initial polling, and when the foreperson announced the results of this vote, the confederates voted with the majority during subsequent pollings until a verdict was reached.

After the deliberations were completed, the participants completed a second questionnaire containing measures of satisfaction with verdict and certainty of verdict correctness. They were then informed that they had been videotaped and given the opportunity to have the tape erased. The reasons for the unobtrusive videotaping procedure were carefully explained to them including the possibility that they might have behaved in a different manner had they been aware of the videotaping process. None of the jurors objected to the videotaping and agreed with the necessity for the unobtrusive procedures employed. Moreover, a vast majority of them were quite enthusiastic about the research and spent considerable time reviewing the videotape record of their deliberation proceedings.

Analysis of the data revealed the following results:

1. Juries exposed to inadmissible evidence sometimes discuss the material even though instructed to disregard it.

2. There were no systematic differences in verdicts between juries exposed to a trial containing inadmissible evidence and juries viewing the same trial devoid of inadmissible evidence.

3. There were no systematic differences in verdicts between juries exposed to inadmissible evidence and who discussed it and those exposed to the material but who did not discuss it.

4. There were no significant differences in certainty of verdicts between jurors exposed to a trial containing inadmissible evidence and jurors viewing the same trial devoid of inadmissible evidence.

5. There were no significant differences in satisfaction with verdict between jurors exposed to a trial containing inadmissible evidence and jurors viewing the same trial devoid of inadmissible evidence.

Although there was no apparent influence upon the verdicts rendered, eight of the 15 juries who viewed the version of the trial containing material ruled inadmissible discussed it during their deliberation proceedings. Moreover, even though no significant differences were observed for the certainty of verdict measure, the results approached statistical significance. Specifically, jurors who heard the inadmissible testimony were more confident that their verdicts were correct than their counterparts not exposed to the material ruled inadmissible.

Question V: What are the effects of various editing techniques used to delete inadmissible materials from videotaped presentations on juror information processing and decision-making activities?

If inadmissible testimony is to be edited, the edit should ideally allow the trial process to flow continuously such that the deletion is not detectable. A noticeable edit may distract jurors and convey the idea that information has been withheld. Four editing techniques are currently available: (1) the clean edit, (2) the video only technique, (3) the blackout, normal speed process, and (4) the blackout, fast forward procedure. Unfortunately, some of these techniques do not achieve the ideal outcome. Hence, one of our studies examined potential effects of these various editing techniques on juror response to videotaped trials.

The earlier discussed videotaped trial of the defendant accused by a commercial bank of conversion of funds was used in this study. The following research questions were examined:

1. Do jurors exposed to different editing techniques demonstrate differences in retention of trial-related information?
2. Do jurors exposed to different editing techniques demonstrate differences in their assessments of the attorneys' credibility?
3. Do jurors exposed to different editing techniques demonstrate differences in their assessments of the witnesses' credibility?
4. Do jurors exposed to different editing techniques report differing levels of distraction?

5. Do jurors exposed to different editing techniques report different verdicts?

A total of 147 jurors from the active jury list in Shiawassee County (Corunna, Michigan) were randomly assigned to one of five conditions. Jurors in each of four conditions viewed a videotape of the trial after it had been edited via one of the four editing techniques examined in this study. Jurors in the fifth condition viewed a "no edit" version of the videotaped trial containing the six instances of inadmissible evidence. The judge's opening remarks addressed the unusual procedures involving the presence of a large number of jurors, the videotaped presentation, and the use of questionnaires. After viewing the trial, jurors were instructed by the judge regarding deliberation procedures, randomly assigned to six-person jury panels, and informed that the majority verdict incorporating all group decisions would be binding on the litigants.

Jurors completed two questionnaires during the course of their service, one prior to and the other following group deliberations. The instruments were designed to measure effects of four editing techniques on: (1) juror retention of trial-related information; (2) juror perception of trial participants on three dimensions of credibility; (3) level of distraction experienced; and (4) individual pre-deliberation verdict.

Analysis of the data revealed the following findings:

1. There were no significant differences in the amount of trial-related information retained by jurors exposed to the various editing techniques.
2. The various editing techniques significantly affected juror perceptions of attorney credibility.
3. The various editing techniques did not significantly affect juror perceptions of the credibility of other trial participants.
4. The various editing techniques significantly affected the level of distraction experienced by jurors.

5. There was no significant relationship between the various editing techniques and pre-deliberation verdicts rendered by jurors.

Although there are a number of implications for the legal community that merit in-depth discussion, present constraints necessitate a brief discussion of these findings.

The significant relationship between editing techniques and juror assessment of counsel credibility is somewhat complex. Inspection of mean credibility ratings for the plaintiff's attorney indicated highly significant differences between the no edit condition and each of the four edited treatments of the trial. Specifically, the attorney was perceived as more credible in the no edit version than in any of the editing conditions while the latter four conditions did not differ significantly. This finding suggests that the act of editing per se, rather than a particular technique, may affect juror perceptions of attorney credibility. Evidence for this possibility must be viewed as equivocal, however, since a similar effect was not found for the defense attorney.

Although the various editing techniques were not significantly related to witness credibility ratings for the plaintiff, the defendant, or the security guard who testified for the plaintiff, the data did reveal one general trend: credibility ratings for all witnesses were lower in the edited conditions. Perhaps the edit itself tends to distort trial information or perhaps jurors become curious and/or disturbed over the deleted information and try to infer what occurred during the edit. Such speculation on what may have transpired during the edited portion of the trial could have a subsequent influence on the trial participants' credibility.

A significant relationship was observed between the various editing techniques and the level of distraction experienced by jurors. The clean edit was the least distracting of the four techniques examined and did not differ significantly from the no edit condition. The remaining three techniques were significantly more distracting than the editless treatment. In addition, the blackout, fast forward and the clean edit techniques did not differ significantly in producing distraction for jurors. The amount of time required to execute the edit is one factor that may serve to explain this pattern of relationships: the clean edit requires only a split-second; the blackout, fast forward required in this trial an average of 17.33 seconds; and the other two procedures required an average of 74.5 seconds.

Finally, these data suggest that neither the current practice of editing videotaped trials *per se* nor the type of editing procedures utilized exerts a systematic effect on the ultimate outcome of the trial. Results revealed no significant relationship between the various editing techniques and individual pre-deliberation verdicts rendered by jurors. It is true, however, that jurors reported that they were distracted by the various techniques. On the assumption that such distraction is detrimental to the trial process, the clean edit technique recommends itself as the source of least distraction among the editing techniques examined.

Question VI: What are the effects of paralinguistic and nonverbal cues on jurors' evaluations of witness demeanor, credibility, and veracity of testimony presented?

Witnesses testifying in a trial sometimes present conflicting testimony about events. These discrepancies may be attributable to differences in individual perceptions or may be the result of intentional deceit. The resolution of conflicting evidence, along with the detection of intentionally distorted information by trial witnesses and litigants, are important concerns of the legal system.

Videotaped depositions have the advantage of preserving the vocal and nonverbal cues of a witness that may prove useful for triers-of-fact in assessing the veracity of a witness' testimony. However, the presentation of mediated information may systematically influence the abilities of triers-of-fact to evaluate the veracity of testimony presented. At present, there is a paucity of data concerning these possibilities. Consequently, two studies were executed that addressed the following questions:

1. Does the mode of presentation of trial testimony affect juror ability to detect deceptive testimony?
2. Are there differences in juror evaluation of a witness testifying live as compared to the testimony being read by a surrogate?

Research by Ekman and Friesen (1974) demonstrated that when individuals lie, they display nonverbal cues that observers use to detect the deception. The observers who participated in Ekman and Friesen's research were able to identify deception more accurately when they observed only a witness' body as compared to a head only view.

This finding suggests an important question: How much of a witness' body should appear on a videotape to maximize the potential of jurors accurately detecting deceptive testimony? In the studies we have discussed thus far, jurors who viewed videotaped trials were provided with relatively the same perspective as jurors in live trials. In the Ekman and Friesen study, observers saw only the body or the head of the testifier. Perhaps those who saw only the body were more accurate because facial cues normally available were absent forcing observers to be more attentive to bodily cues. If cues emanating from the head had been available for observation, they may have distracted subjects from attending to leakage cues coming from the body. The first study reported in this section included a head and body condition to evaluate this possibility.

The Ekman and Friesen (1974) study focused upon only nonverbal cues; observers were not permitted to hear the stimulus individuals speak, but merely observed the nonverbal behavior of the speakers while they were communicating. Knapp, Hart, and Dennis (1974) suggest that the discrepancy between verbal and nonverbal cues may provide the most useful information for detecting deceit. No data are available concerning how verbal cues interact with nonverbal cues emanating from the head only, body only, or head and body to provide jurors with information that will enhance the possibility of detecting deception. The present study sought data relative to these questions when jurors are exposed either to color or black-and-white videotaped testimony.

Twenty-three undergraduate students majoring in criminal justice at Michigan State University were recruited to play the role of "deceivers" in this study. They were told that police officers are frequently required to behave deceptively and were further led to believe that their ability to "deceive" would be an important indicator of their potential as police officers. This information was conveyed to them to increase their involvement in the deception task.

The participants viewed one of two videotaped versions (either violent or nonviolent) of a convicted criminal being sentenced for homocide. They also viewed a series of color slides showing both very pleasant and very unpleasant scenes. Stimulus tapes consisted of recorded interviews with participants: (1) telling the truth in response to questions about their personal characteristics; (2) both lying and telling the truth at specified times regarding the factual content of the videotape previously shown; (3) lying about their feelings aroused by the unpleasant slides; and (4) telling the truth concerning their feelings about the pleasant slides. The interviews were videotaped with two color cameras, one recording a close-up shot of each "deceiver's" head and the other maintaining a full view of each deceiver's entire body.

Eight truthful and eight lying segments were randomly assigned to Tape 1. Four of each group were factual and four were emotional responses. Tape 2 was created by taking the opposite (truthful or deceptive) behavior for each participant from the same segment (i.e., factual or emotional).

Four tapes including the audio portions of the interviews were made: (1) head only, Tape 1; (2) head and body, Tape 1; (3) head only, Tape 2; and (4) head and body, Tape 2. (A body only version of each tape was subsequently created by deleting the head portion of the head and body view.) These four versions provided stimuli for the subsequent audio-visual experimental condition. In addition, three other conditions were created: a visual-only condition duplicating the video portions of the four audio-visual tapes with the audio portions deleted; a transcript condition including only typewritten verbal answers; and an audio only condition containing the audio portions of the four audio-visual tapes. Monochromatic treatments of visual conditions presented the identical color stimuli via monochromatic television monitors.

Observers who assessed the veracity of "deceivers" were 730 undergraduate students at Michigan State University. Thirty-six intact groups were randomly assigned to a total of 28 experimental sub-conditions across the two (color and monochromatic) presentational modes. A second group of adults from the Lansing, Michigan, area also served as observers. Adult observers (due to numbers available) were assigned to only eight experimental conditions most comparable to the courtroom experience: head and body (Tapes 1 and 2) and head only (Tapes 1 and 2), in both color and monochromatic modes.

Besides the standard demographic information, the questionnaire was designed to collect data on: (1) truth-deception judgments for each of 16 "deceivers"; (2) the observer's level of confidence in each judgment; (3) how successful observers perceived themselves to be in detecting deception; (4) the observer's level of interest in the experiment; and (5) possible observer difficulties experienced in viewing the stimulus tapes.

Initially, the effects of various recording procedures on emotional, factual, and total accuracy of veracity judgments were examined for the following treatments: (1) color v. black-and-white; (2) audio-visual v. visual only; (3) head-body/head-only/body-only; and (4) Tape 1 v. Tape 2. Finally, the adult sample data were compared with the student sample data to ensure the generalizability of results from the student data. Analysis of the data from this study revealed the following results:

1. Observers were able to detect deception in emotional testimony more accurately in the body-only condition as compared to the head-body and head-only conditions.
2. Observer veracity judgments of factual testimony were more accurate in the audio-visual condition as compared to the visual-only condition.
3. Observer veracity judgments of factual testimony were more accurate in the head-body condition as compared to the head-only and body-only conditions.
4. Observer overall veracity judgments for both emotional and factual testimony were more accurate in the audio-visual condition as compared to the visual-only condition.
5. Observer veracity judgments were more reliable in the color condition than the black-and-white condition.

Data on observer ability to accurately detect deception in emotional testimony revealed a statistically significant effect for the head-body/head-only/body-only comparison. Observers were able to detect the deceptive testimony more accurately in the body-only condition. This finding is consistent with the previous research conducted by Ekman and Friesen (1974).

With regard to observer ability to assess accurately the veracity of factual testimony, two statistically significant effects were observed: (1) the audio-visual versus visual-only analysis indicated that observer veracity jugments were more accurate in the audio-visual condition; and (2) the head-body/head-only/body-only analysis revealed that observer judgments were more accurate in the head-body condition. The latter findings may be of greater interest to the legal community since most testimony offered in the courtroom is factual. It is also unlikely that videotaped testimony presenting a decapitated view of the witness would be used.

Relative to the observer's total accuracy (emotional and factual accuracy) as a detector of deceptive testimony, the audio-visual and visual-only comparison identified one statistically significant relationship. Observers were better able to detect deceptive testimony in the audio-visual condition. The color versus black-and-white analysis indicated substantial although not statistically significant differences in total accuracy scores between the two modes. Observer judgments were considerably more reliable in the color condition.

One possible explanation for the lack of a significant total accuracy effect for the head-body/head-only/body-only comparison lies in the fact that different effects were observed for emotional accuracy and factual accuracy. The highest emotional accuracy scores were observed in the body-only condition, while the highest factual accuracy scores were observed in the head-body condition. When effects of the two factors are combined, the significant relationships tend to cancel each other out.

Finally, comparison of the data for the student and adult samples indicated that the two samples were comparable. Thus, findings from the student data appear to be generalizable to an adult population.

In summary, these results suggest that nonverbal leakage from the body facilitates detection of deception when the witness is testifying about his/her emotions. When testimony is factual, the verbal component contributes to accurate detection of deception. Although there was not a statistically significant difference between color and monochromatic modes of presentation, color taping produced more reliable veracity judgments.

When using videotape in the courtroom, these findings suggest using a camera shot which includes the entire body and head of the witness, a perspective that would maximize juror ability to assess accurately both emotional and factual testimony. The possibility also exists that the typical design and structure of the witness stand blocks juror vision of nonverbal body cues that may aid in the identification of deceptive emotional testimony.

A second study was executed to explore the deception issue in more detail. This study examined the interaction of verbal and nonverbal cues in a holistic approach and focused on three hypotheses: (1) the information utilization hypothesis; (2) the distraction hypothesis; and (3) the information overload hypothesis.

The information utilization hypothesis suggests that as the amount and quality of verbal and nonverbal information available to observers increases, they will be better able to detect signals of deceit, and thus, more accurately assess the veracity of information presented. This rationale has been offered by researchers involved with the study of teleconferencing (Ryan, 1976), and is at least implied by Ekman and Friesen (1969, 1974) in their discussion of nonverbal leakage and clues to deception.

The distraction hypothesis stems from research investigating the effects of distractive stimuli on persuasion and source credibility. Distraction apparently facilitates persuasion by dividing the attention of persuadees, reducing their ability to scrutinize incoming information, and ultimately increasing their susceptibility to influence (Breitrose, 1966; Dorris, 1967; Osterhouse & Brock, 1970; Keating & Brock, 1974). Accordingly, increasing the number of available verbal and nonverbal cues may place greater demands on receiver attention. If so, extraneous behavioral cues may distract observer attention from potential indicators of deceit, resulting in reduced judgmental accuracy. Maier and Thurber (1968) suggested the distraction effect as a possible explanation for their findings.

The information overload hypothesis makes predictions similar to the distraction hypothesis with one important exception. The distraction viewpoint reasons that when available stimuli increase, observers attend to extraneous as well as relevant truth/deception cues while the overload explanation holds that observers are blocking out some of these important cues. Danowski (1974) explains that when observers receive more information than they can process, confusion results producing greater communicative error. By analogy, this hypothesis predicts that as information overload increases, the accuracy of truth/deception attributions will decrease.

Since previous research does not justify a single, _a priori_ choice among these hypotheses, the present study compared the three by: (1) varying the medium through which observers were exposed to truthful and deceptive communication; (2) obtaining estimates of the amount of verbal/nonverbal information afforded by each medium; and (3) examining the accuracy of truth/deception judgments in relation to these variations.

"Deceivers" in this study were six male and six female undergraduate students enrolled at Michigan State University who volunteered to participate in a "group problem-solving study." They were randomly assigned to either the deception or truthful condition, controlling for sex. The deception-inducing procedure was modeled after one employed in previous research by Exline _et al._ (1970) and Shulman (1973).

Each participant was engaged in a dyadic problem-solving task coupled with a student "from another class" (the experimenter's confederate). To motivate task interest, participants were told the dyad with the best performance would receive a monetary award. The deception-inducing condition implicated participants in cheating behavior via the confederate, to ostensibly achieve higher performance. Subsequent interviews were conducted with each participant regarding the strategies used to complete the task.

Four conditions were established by varying the medium through which participants were observed while giving truthful and deceptive testimony: (1) the live condition, in which participants were viewed through a one-way mirror; (2) the videotaped condition, recorded through the same mirror; (3) the audiotaped condition, using the videotape sound track; and (4) the written transcript condition, constructed from the videotape sound track.

Eighty undergraduate students enrolled at Michigan State University acted as observers from whom judgments of veracity were obtained. Sub-groups of 20 observers were randomly assigned to view three "deceivers" in each of the four conditions, producing a total of 240 observations.

Eight trained coders provided estimates of the available nonverbal information (facial expression, eye contact, hand and body movement, voice tone, etc.) and the available total information provided by each stimulus in all four transmission channels. Inter-coder reliability indices (a measure of consistency among coders) were computed for both measures of information and were found to be highly reliable.

Analysis of these data yielded the following findings:

1. No significant difference was found between the ability of observers to detect deception when testimony was presented live, on videotape, or by written transcript.
2. Audiotape presentation of testimony resulted in significantly lower accuracy in detecting deception than did live presentation.
3. Even when they were forewarned that 50% of the time a communicator would be lying, untrained observers could not detect deception with a high degree of proficiency.

4. The visual element of a presentation apparently added little to an observer's ability to detect deception.

The findings provide no support for any of the three hypotheses discussed earlier: information utilization, information overload, or distraction. Measures of available total information accounted for a negligible amount (less than 1%) of variation in observers' accuracy scores. A relatively high accuracy score (46.7%) in the transcript condition suggests that a direct relationship between available information and the ability of untrained observers to detect deception is unlikely. In fact, considering the low accuracy scores obtained in all conditions: 56.7% for the live observation; 46.7% for videotape and transcript; and 31.6% for the audiotape; it is highly questionable whether untrained observers can accurately detect deception perpetrated by strangers. None of these scores differed significantly from the 50% criterion researchers have usually defined as chance accuracy for studies of this type.

These results suggest that jurors evaluating the veracity of testimony presented during a trial will probably not be able to spot perjury with any high degree of accuracy. Furthermore, the use of videotape to present testimony of unavailable witnesses should not have a noticeable effect on jurors' ability to assess the veracity of testimony presented. Consequently, the decision of whether or not to use videotaped testimony in courtroom trials should not hinge upon the capacity of this medium to influence juror judgment of witness veracity.

Question VII: What are the effects of certain videotape production techniques on juror information processing and decision-making behaviors?

Many individuals interested in the use of videotape in the legal system have expressed concern about the potential biasing effects that might be introduced into the trial process through the intentional or unintentional use of film and television production techniques (e.g., Bermant, McGuire & Chappell, 1975). From a technical perspective, the factors germane to this concern encompass the quality of equipment used, the competence of the technicians operating the equipment, the production techniques employed, and the editing of a videotape (see Doret, 1974).

Currently, the rules governing the videotaping and presentation of testimony are minimal. For example, Ohio's Superintendence Rule 15 stipulates that standard one-half inch videotape equipment constitutes the standard for videotaping and playback of testimony and other evidence. However, the ruling allows for deviations from the standard as long as compatible equipment is supplied or the original tape is converted such that it is compatible with the standard. The only other requirement is there must be a minimum of one monitor having at least a 14 inch screen for playback to the jury.

Ohio's Superintendence Rule 15 provides litigants with considerable freedom as far as videotaping procedures are concerned. The ruling does not provide guidelines relevant to the use of lighting, panning, zooming, camera angles, special effects, etc. Conceivably, the use of these numerous production techniques could systematically affect the information presented during a trial. Moreover, jurors' perceptions of trial participants might be influenced differently by various types of production techniques. Unfortunately, little research has examined the effects that different production techniques might have on viewers. Consequently, three studies were executed to evaluate the potential effects of various production techniques upon juror information processing and decision-making behaviors. The first study compared a split-screen video presentation to a full-screen presentation. The second study focused upon differences that might accrue from using multi-camera video recording systems rather than a single camera system. The third study investigated the potential impact on jurors of using different camera shots to videotape trial testimony.

The split-screen videotape version of the Nugent v. Clark study discussed earlier served as the stimulus for the first study discussed in this section. As mentioned earlier, the triple camera, split-screen system allows the juror to study idiosyncratic responses of participants in greater detail by providing a close-up view of the witness in the upper left quarter of the screen, a close-up view of the questioning attorney in the upper right quarter, and a panoramic view of the courtroom in the lower half of the screen. The potential disadvantage of this system is its lack of realism since it relies on technology to create a more visible, yet less natural product. This type of presentation was compared to a full-screen presentation of the trial.

Again, theoretical arguments for opposing advantages and disadvantages of the two systems seem equally plausible, and consequently, rather than testing competing hypotheses, the study was question-oriented. Specifically, the following research questions were explored:

1. Do jurors exposed to a split-screen presentation attribute negligence to litigants to a greater or lesser degree than jurors exposed to a full-screen presentation?
2. Do jurors exposed to a split-screen presentation award larger or smaller monetary judgments to litigants than jurors exposed to a full-screen presentation?
3. Do jurors exposed to a split-screen presentation perceive attorneys as more or less credible than jurors exposed to a full-screen presentation?
4. Do jurors exposed to a split-screen presentation retain more or less trial-related information than jurors exposed to a full-screen presentation?
5. Do jurors exposed to a split-screen presentation report more or less motivation and interest than do jurors who view a full-screen presentation?

Fifty-seven adult members of a Catholic church group participated in the study. Their demographic characteristics were similar to those of typical jury panels. Because of constraints on the availability of a courtroom and impaneled jurors, this study was conducted outside an actual courtroom setting. Participants were randomly assigned to view either the full-screen or split-screen videotaped version of the trial. They were instructed to assume the role of jurors and assured they would be viewing the reenactment of an actual trial. After viewing the trial, participants completed a questionnaire. Analysis of the data produced the following results:

1. The type of presentation did not significantly affect juror attributions of negligence.
2. The type of presentation did not significantly affect the awards of jurors finding for the plaintiffs.
3. The type of presentation significantly affected juror perceptions of attorney credibility.
4. The type of presentation did not significantly affect the amount of trial-related information retained by jurors.
5. The type of presentation did not significantly affect juror interest or motivation in the trial.

Analysis of the data revealed no convincing evidence that the type of videotaped presentation infuenced juror attributions of negligence. Although jurors did find for the plaintiffs somewhat more frequently in the full-screen production, these differences did not approach statistical significance.

Mean awards to the plaintiffs were analyzed in two ways. First, only those jurors in the full-screen and split-screen conditions who stipulated an award for the plaintiffs were compared. Second, mean awards for all jurors in each group, including those who did not stipulate an award, were compared. In both cases, these comparisons yielded no significant differences.

There was some indication that the type of presentation may influence juror perceptions of attorney credibility; however, the evidence was not overwhelming since the differences were statistically significant only in the case of one attorney. Counsel for the plaintiff was rated more credible by jurors who observed the trial via split-screening, but the ratings for the defense attorney, while also higher in the split-screen condition, did not reach the required level of statistical significance. Hence, of the two systems compared in this study, the split-screen technique may foster more credible perceptions of the trial lawyer.

Juror retention of trial-related information was not affected by the type of production system employed. Mean retention scores across both screening conditions were approximately equal and did not differ significantly.

Additionally, the study provides no clear evidence that the two videotape presentational methods contributed to varying degrees of juror interest and motivation. Although a marked trend toward higher ratings on these variables was observed in the split-screen condition, the mean difference between the two systems approached, but did not reach the required significance level.

On the basis of this study, then, the two taping systems do not appear to engender differing juror responses. The single exception, favoring the split-screen method, involves juror perceptions of attorney credibility; given reasonably good presentational skills, attorneys may profit from the greater detail provided by the split-screen system.

There are several possible explanations for this finding. Informal observation indicated that the plaintiffs' attorney relied more heavily on subtle nonverbal techniques while the defense attorney used strong vocal delivery and persuasive voice inflection. Obviously, the nonverbal talents of the former could be observed more readily in the split-screen condition, while the defense attorney's vocal ability would be perceived similarly on either system. Hence, the credibility of the plaintiffs' attorney may have been enhanced by the split-screen system.

A second explanation was also considered. Numerous studies (e.g., Byrne, London & Reeves, 1968; Berscheid & Walster, 1969; Dion, Berscheid & Walster, 1972) have demonstrated that people respond differently to individuals who vary in physical attractiveness. Perhaps variations in physical attractiveness exerted some influence on juror perceptions of counsel credibility in the previous study. Given the greater detail provided, effects of physical attractiveness would likely be more pronounced in the split-screen presentation. Since no data were previously collected relative to these hypotheses, it was decided to execute a modified replication of this study taking direct assessments of physical attractiveness and nonverbal communication effectiveness for both attorneys.

This second study compared the effects of a multi-camera split-screen system to a single camera full-screen video production system. The stimulus trial used for this study was the same as the one used to evaluate the effects of inadmissible evidence on juror deliberation proceedings and the effects of various editing techniques on juror information processing behavior. As mentioned earlier, the video system required to tape the split-screen version of this trial included four monochromatic fixed cameras. One camera was focused on the witness stand, one on the plaintiff's attorney when he was seated, one on the defendant's attorney when he was seated, and the final camera was focused upon the podium where either attorney would stand when questioning a witness. A special effects generator was integrated into this system to enable us to record a shot in which the interrogating attorney occupied one-half of the screen (vertically) and the witness being questioned the remaining half. The shots produced of each of the trial participants were of the upper one-third of their bodies.

The trial contained six instances of inadmissible evidence. Each time the attorney who was seated and off-camera raised an objection, the camera focused upon him was activated remotely by the technician manning the special effects generator. This produced an image in which the objecting attorney replaced the witness on the video monitor such that the objecting attorney appeared in one-half of the screen and the interrogating attorney in the other half. The use of this system ensured that jurors would be able to pick up many subtle nuances in facial expression and gesture of the trial witnesses and the interrogating attorney. The system had the additional advantage of ensuring that jurors could observe the nonverbal behavior of both attorneys when objections were raised.

There are a number of limitations associated with this type of system that merit comment. The trial judge only appeared on camera at the beginning and end of the trial: at the beginning he instructed the jury concerning the litigation that was before the court; at the end he instructed the jury concerning their deliberation and verdict. The panoramic view of the judge convening the trial and giving the jury instructions recorded on the color system was edited in black-and-white onto the tape produced by the monochromatic system. Consequently, the judge's opening statement and instructions were exactly the same for the jurors who would view the full-screen version and those who would view the split-screen presentation.

The split-screen version has a second limitation. It is an "unnatural" communication product produced through the use of technology. Only the individual testifying and the questioning attorney appear on the video monitor except when objections are raised and both attorneys are presented. The rest of the litigants remain off-camera save for when they are testifying.

A third limitation of the split-screen system is the cost. It is significantly more expensive than the full-screen system.

The questions addressed in this study were as follows:

1. Do jurors exposed to a split-screen presentation perceive attorneys as more or less credible than jurors exposed to a full-screen presentation?

2. Do jurors exposed to a split-screen presentation report guilty or innocent verdicts more frequently than jurors exposed to a full-screen presentation?

3. Do jurors exposed to a split-screen presentation find attorneys more or less physically attractive than jurors exposed to a full-screen presentation?

4. Do jurors exposed to a split-screen presentation evaluate the nonverbal communicative effectiveness of attorneys differently than jurors exposed to a full-screen presentation?

Because of limitations on the availability of a courtroom setting and impaneled jurors, 72 undergraduate students attending Michigan State University were randomly assigned to one of two conditions, either the split-screen or the full-screen presentation. Participants were informed that they would be viewing an actual trial on videotape and were requested to assume that their verdict would be binding upon the litigants. After viewing the trial, the participants completed a questionnaire. Analysis of the data produced the following results:

1. Jurors' perceptions of attorney credibility were not significantly influenced by the type of presentation.

2. The type of presentation did not significantly influence the verdicts arrived at by jurors.

3. The type of presentation did not significantly influence juror perceptions of the physical attractiveness of the attorneys.

4. The type of presentation significantly affected juror assessments of the attorneys' nonverbal communication effectiveness.

Participants exposed to the full-screen trial presentation found the defense attorney's nonverbal communication to be more effective than did their counterparts who viewed the split-screen presentation. This may be attributable to the use of very expressive hand gestures used by the defense attorney to emphasize important issues during his questioning of witnesses and during his closing argument, which were more visible in the full-screen presentation. The plaintiff's attorney's nonverbal expressions were visibly more reserved. However, neither this variable nor any of the others discussed exerted any systematic influence upon the verdicts of the jurors.

A third study assessed the effects of different types of camera shots on many of the variables discussed in the two previous studies. The question of what image to present to jurors when videotaping testimony has been raised by many individuals concerned about the use of videotape in the legal environment. Doret (1974) has addressed some of the issues germane to this question. Many technological alternatives are available when taping an entire trial including the use of different types of camera shots. There are advantages and disadvantages associated with the use of any given shot selected from the array of camera shots that can be produced given current technology. For example, Doret (1974) states that a shot that offers a panoramic view of the courtroom offers the jury:

> ...a viewing experience similar to that of watching a movie of a stage play. The advantage of this method is that it deviates least, in terms of the visual field offered the juror, from the traditional trial, and offers the juror the widest possible universe of sensory data to formulate his impressions upon. The disadvantage of this method is the inability of the panorama to capture in detail the nuances of the demeanor of the witness (pp. 233-234).

The problem of the lack of visual detail associated with the panoramic shot could be alleviated by using a close-up (head and shoulders) or medium (head and torso) shot of the testifying witness. However, these shots also have limitations. First, the amount of sensory data available to the juror would be greatly reduced. Whether or not this loss of information has any systematic affect on the jurors' information processing is unknown. Any other disadvantages that may exist are contingent upon how the shot is executed in the context of the trial itself. If the camera is positioned for a close-up or medium shot and remains stationary,

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jurors may disassociate the witness from the courtroom environment or whatever setting in which the taping occurred. Further, the jurors would be unable to see the behavior of the trial participants that are off camera. The other trial participants' reactions to a given witness' testimony may constitute important information for jurors.

The potential problems associated with a stationary close-up or medium shot could by ameliorated by utilizing a multiple camera system, offering the jurors a variety of shots. Unfortunately, the number of shot combinations that could be produced is formidable and would require a considerable investment of both time and financial resources to evaluate. Moreover, the sophistication of the equipment required to produce these techniques exceeds that which is presently used in the courts. It was therefore decided to evaluate the effects of stationary shots in this study.

Numerous television and film production texts discuss the use of various camera techniques. Many of these texts are limited to "how to" discussions which describe use of different types of lenses, cameras, dollies, etc., but do not address the effects of these techniques upon viewers (cf., Fulton, 1960; Quick & LaBau, 1972; Scott, 1975). However, a few available texts do provide some discussion of how viewers may react to various camera techniques (Eisenstein, 1960; Bretz, 1962; Millerson, 1964; Zettl, 1966; Lewis, 1968; Davis, 1960; Madsen, 1973). While the effects of many different camera techniques are discussed, only two are of concern here: (1) camera shots and (2) camera angles.

Four types of camera shots are central to television production ranging from an extreme close-up shot to an extreme long shot:

1. close-up shot: tight focus on the head and shoulders of individual(s)
2. medium shot: focus from the head to just above the waist of individual(s)

3. long shot:	full focus of individual(s) from head to foot
4. very long shot:	focus on many individuals and surroundings, with any individual occupying only a fraction of the total image

Millerson (1964) describes the utility of each of these four shots. The very long shot "... establishes broad location, creates an overall atmospheric impression of an environment, and can coordinate several small action groups as well as accommodating widespread action" (p. 223). Individuals appearing in the very long shot are impersonal and detached from the viewer while the environment becomes the central focus. The primary purpose of the very long shot is to provide viewers with a sense of location.

Depending upon the setting, the long shot can also provide viewers with a sense of location. However, individuals are less impersonal because movement is more discernible and facial expressions and gestures are more dominant. Simply stated, more emphasis is placed upon individuals within a setting rather than the setting itself.

The medium shot brings the action even closer to viewers. Facial expressions and gestures are afforded greater prominence. The primary purpose of this type of shot is to direct the attention of viewers to one or two individuals within a setting and maximize the sensory cues presented.

The close-up shot focuses viewer attention on details that might otherwise be unavailable or overlooked in presentations using the other types of camera shots. The close-up technique is relied upon to produce dramatic emphasis of specific details (Madsen, 1973).

The general effect of different camera shots is to direct the attention of the viewer toward the setting or some particular action within the setting. Unfortunately, there are no discussions of the potential effect of these various camera shots offered. This is not surprising given that any effects would be highly dependent upon not only the type of shot used but the timing of the shot and the nature of the material being filmed as well.

Most authors do offer warnings concerning the indiscriminate use of various camera shots. Davis (1960), for example, warns that if the shot alteration is untimely or poorly executed, viewers will pay more attention to the technique than to the material being presented. Millerson (1964) cautions that viewers may lose their sense of orientation to the material being presented if a close-up shot lasts too long and become suspicious that something more interesting is occurring off camera. Conversely, inappropriate use of the long shot may bore viewers because of the lack of visual detail presented.

Madsen (1973) contends that the medium shot is most flexible because the focal individual can move forward into a close-up or away into a long shot. Moreover, the visual detail provided by the medium shot permits movements and gestures to be seen readily by viewers.

Some research has assessed the effects of various camera shots. Utilizing a televised lecture presented on television monitors, Williams (1965) tested the effects of varying camera shots on viewers' expressed interest. The results of his study indicated that interest level did not differ significantly as a result of using a variety of close-up and long shots compared to a static medium shot. Nevertheless, when the same lecture was projected on a film screen, viewers' expressed interest level significantly decreased when a long shot was employed.

Wurtzel and Dominick (1971-72) examined the effects of acting style and camera shot on viewers' evaluations of television drama. An eleven minute emotional scene was performed by three professional actors utilizing two different acting styles: (1) film acting and (2) stage acting. Stage acting differs from film acting because gestures and expressions are more elaborate and pronounced when an actor is performing on stage. The scene was filmed four times to obtain the levels of the two independent variables of acting style (film acting and stage acting) and type of shot (close-up and medium). The results of the study indicated that viewers evaluated the scene more favorably when the actors were film acting and a close-up shot was used as opposed to a medium shot. Moreover, viewers in the medium shot condition evaluated the scene more favorably than did viewers in the close-up shot condition when stage acting was employed.

McCain and Repensky (1972) examined the effect of camera shot on interpersonal attraction. Two comedians, Edmonds and Curly, performed two comedy routines which were taped using three camera shots simultaneously -- a close-up shot, a medium shot, and a long shot. The measure of interpersonal attraction used in this study consisted of a physical attraction, social attraction, and task attraction dimension.

The results of this study indicated that the type of camera shot does affect interpersonal attraction although the effects differed for each performer. Edmonds was perceived as more physically attractive in the close-up shot than in the medium or long shot. Curly was perceived as more physically attractive than Edmonds in the medium and long shots while there was no difference between the physical attractiveness ratings of the comedians in the close-up shot. Although no significant differences were observed for the social attractiveness dimension, type of shot significantly influenced participants' assessments of task attractiveness. Curly was perceived as most attractive in the close-up condition while Edmonds was perceived as least task attractive in the close-up condition. There were no other differences observed on this dimension.

Obviously the source characteristics of the two comedians interacted with the type of camera shots employed in the experiment. However, the particular source characteristics that may have contributed to these differences were not isolated. The researchers speculated about potential causes including the roles of the comedians (i.e., straight-man vs. funny-man), their physical appearance, and the quality of their performances.

McCain and Divers (1973) executed a study designed to evaluate the interaction effects between two source characteristics---body type and sex of a source---and type of shot on interpersonal attraction and source credibility. Three males and three females were selected who collectively possessed body types conforming to those explicated by Sheldon (1954): (1) endomorph (fat or plump), (2) mesomorph (muscular or athletic), and (3) ectomorph (thin or skinny). Each of the six individuals delivered the same "three minute neutral speech" and was videotaped using a close-up, medium, and long shot.

Different groups of respondents then viewed one of the videotapes and rated the interpersonal attractiveness and source credibility of each speaker. The interpersonal attraction measure consisted of three dimensions: (1) physical attraction, (2) social attraction, and (3) task attraction. The measure of source credibility consisted of five dimensions: (1) competence, (2) sociability, (3) dynamism, (4) composure, and (5) character.

While the type of camera shot used by itself did not exert any systematic influence upon respondents' perceptions of the speakers, body type and sex interacted with type of camera shot and significantly influenced evaluations of the speakers. Both speaker body type and sex of speaker independently affected perceptions of the message sources. However, these results are extremely difficult to interpret because many source characteristics were not taken into account. For example, the results concerning sex of the speaker were interpreted cautiously by the researchers for the following reasons:

> Since only one person represented each body type, the differences are really personal attribute differences of single individuals. Facial expression, fluency of presentation and

> other nonverbal variations between males and females may well Provide better explanations for differences between them than their gender differences (McCain & Divers, 1973, pp. 9-10).

The results of the studies focusing upon the potential effects of various camera shots upon viewers' evaluations of message sources are mixed at best. However, one observation was consistent across these studies -- individual source characteristics interact with various types of camera shots and influence message recipients' perceptions of message sources.

Although the implications of findings from many of the studies discussed thus far are less than clear because source presentation styles were not taken into account, the study by Wurtzel and Dominick (1971-72) carefully assessed this issue. Recall that their findings clearly indicated that acting style interacts with camera shot. Previous research executed by us demonstrated that a testifying witness' delivery style significantly influenced the amount of information retained by jurors. Specifically, jurors exposed to the testimony of a strong witness retained significantly more information than their counterparts who heard the same testimony presented by a weak witness. Assuming that acting style encompasses the same communicative source characteristics as delivery style, it is reasonable to expect that the type of camera shot used to tape testimony would interact with delivery style and influence juror evaluations of witnesses.

Based upon this reasoning, results from our own previous research, and the research reviewed, we decided to assess the effects of witness type (strong and weak) and type of camera shot (close-up, medium, and long) on viewers' perceptions of witness: (1) composure, (2) credibility, (3) authority, and (4) character. The credibility measure employed in this study consisted of three different dimensions including safety, qualification, and dynamism. The amount of information retained by viewers and their level of interest in the proceedings was also assessed.

Given that we had some relatively clear expectations concerning the potential effects of type of shot and witness type upon the aforementioned dependent variables, hypotheses were developed and tested rather than research questions. The following eight hypotheses were tested for the effects of witness type upon composure, safety, qualification, dynamism, authority, character, information retention, and interest:

H_1: A strong witness will be perceived more composed than a weak witness.

H_2: A strong witness will be perceived safer than a weak witness.

H_3: A strong witness will be perceived more qualified than a weak witness.

H_4: A strong witness will be perceived more dynamic than a weak witness.

H_5: A strong witness will be perceived more authoritative than a weak witness.

H_6: A strong witness will be perceived as having higher character than a weak witness.

H_7: Jurors exposed to a strong witness will retain more information than jurors exposed to a weak witness.

H_8: Jurors exposed to a strong witness will express greater interest than jurors exposed to a weak witness.

The next set of hypotheses were tested to assess the effects of camera shot and witness type upon juror perception of witness composure, safety, qualification, dynamism, authority, and character. The first eight concern the strong witness while the last eight focus upon the weak witness. (A note of explanation is appropriate at this juncture. For all 16 hypotheses, a "greater than" sign (>) is employed in order to express the pattern of predicted outcomes. The mean (average) ratings of the dependent variable are expected to be significantly greater in those shots listed to the left of the sign. For example:

close-up shot > medium shot > long shot

This indicates that the mean ratings of the dependent variable will be significantly greater in the close-up shot than in either the medium or long shots. In addition, the mean ratings for the medium shot will be significantly greater than the mean ratings for the long shot.) The following hypotheses focus upon the strong witness:

H_9 : Composure: close-up > medium shot > long shot
H_{10}: Safety: close-up > medium shot > long shot
H_{11}: Qualification: close-up > medium shot > long shot
H_{12}: Dynamism: close-up > medium shot > long shot
H_{13}: Authority: close-up > medium shot > long shot
H_{14}: Character: close-up > medium shot > long shot
H_{15}: Information Retention: close-up > medium shot > long shot
H_{16}: Interest: close-up > medium shot > long shot

The following hypotheses concern the weak witness:

H_{17}: Composure: long shot > medium shot > close-up
H_{18}: Safety: long shot > medium shot > close-up
H_{19}: Qualification: long shot > medium shot > close-up
H_{20}: Dynamism: long shot > medium shot > close-up
H_{21}: Authority: long shot > medium shot > close-up
H_{22}: Character: long shot > medium shot > close-up
H_{23}: Information Retention: long shot > medium shot > close-up
H_{24}: Interest: long shot > medium shot > close-up

These last 16 hypotheses suggest a general interaction hypothesis:

H_{25}: Juror perceptions of the strong witness will be more favorable in the closer shots while juror perceptions of the weak witness will be more favorable in the longer shots.

With the aid of legal experts, a transcript of an actual deposition containing plaintiff's attorney's cross-examination of a defendant accused of negligence that caused an industrial accident was selected. Professional male actors were retained to play the roles of the defendant and the defense attorney and a practicing trial attorney played the role of the plaintiff's attorney.

The type of witness manipulation consisted of the actor assuming the role of the defendant, testifying first using a delivery style characteristic of a strong witness and testifving again using a delivery style endemic to a weak witness. The actor was carefully trained to emit both verbal and nonverbal cues, identified through previous research, that are characteristic of strong and weak witnesses.

While in the role of a strong witness, the actor was directed to speak fluently and with confidence; hold his head erect; maintain eye contact with the interrogating attorney; and lean slightly toward him. Additionally, he was instructed to present a relaxed demeanor and avoid any fidgeting with his hands and feet. As a weak witness, the actor was trained to speak softly and nonfluently; insert pauses, "ums" and "uhs," in his sentences; maintain low eye contact with the questioning attorney; and to lean slightly away from him. Moreover, he was requested visibly to tense his muscles and to fidget with his hands and feet.

The deposition was videotaped in a television studio at Michigan State University with the participants seated at a rectangular table positioned in front of a plain backdrop. The defendant was seated at the middle and the attorneys at both ends. The deposition was videotaped in color utilizing three cameras simultaneously in order to record the three types of camera shots, close-up, medium and long. Given the potential biasing effects of various camera angles, an angle of 90° to the vertical plane was used because it produces minimal biasing effects (Millerson, 1964). Each of the three camera shots was focused only upon the testifying witness. A fourth camera set for a very long shot of both attorneys and the witness was also used during the taping. The beginning and end of the tape produced by this camera was edited onto the beginnings and ends of the videotapes produced by the other three cameras to provide viewers with a sense of location. The deposition was videotaped twice, once for the strong witness manipulation and again for the weak witness manipulation.

The subjects participating in this study were 197 undergraduate student volunteers enrolled in communication courses at Michigan State University who were randomly assigned to one of the six conditions in the experiment. (Thirty-five of these subjects were randomly deleted to achieve equal sample sizes in each condition for purposes of data analysis.) To provide a context for the deposition, a brief trial summary prepared with the assistance of legal experts was given to the subjects. They were told that the videotaped deposition had been used in a trial that was otherwise live and that the researchers had been given permission to use both the trial summary and videotape in their research focusing upon jury size. These participants were also told that after reading the synopsis and viewing the videotaped deposition, they would be assigned to juries for deliberation. After viewing the videotape, subjects completed a questionnaire and were debriefed.

The results for the 25 hypotheses discussed earlier will be summarized in three sections. The first section discusses the results for Hypotheses 1 through 8 which address the relationship between witness type and the eight dependent variables. The second section discusses the results of Hypotheses 9 through 16 which address the effects of camera shot upon the eight dependent variables for the strong witness. The third section discusses the results of Hypotheses 17 through 24 which concern the effects of camera shot upon the eight dependent variables for the weak witness. In addition, the findings germane to Hypothesis 25 will be discussed.

An analysis of the effects of witness type revealed the following findings:

1. The strong witness was perceived significantly more composed, qualified, and dynamic than the weak witness.
2. Subjects did not perceive the strong and weak witnesses significantly different in terms of safety, authority, or character.
3. Subjects exposed to a strong witness retained significantly more information than subjects exposed to a weak witness.
4. Subjects exposed to a strong witness expressed greater interest in the proceedings than subjects exposed to a weak witness.

Therefore, the data supported Hypotheses 1, 3, 4, 7, and 8. Hypotheses 2, 5, and 6 were not supported by the data.

An analysis of the effects of camera shot for the strong witness produced the following results:

5a. The strong witness was perceived significantly more authoritative in the close-up shot than in the long shot.

5b. Authority ratings of the strong witness in the medium shot did not differ significantly from ratings obtained in the close-up or long shots.

6. Different camera shots did not significantly affect subjects' perceptions of the strong witness' composure, safety, qualification, dynamism, or character.
7. Different camera shots did not significantly affect the amount of information retained by subjects exposed to the strong witness.
8. Different camera shots did not significantly affect the amount of expressed interest by subjects exposed to the strong witness.

Consequently, partial support was obtained for Hypothesis 13. The data did not support Hypotheses 9, 10, 11, 12, 14, 15, or 16.

An analysis of the effects of camera shot for the weak witness yielded the following findings:

9a. The weak witness was perceived significantly more composed in the close-up shot than in either the medium or long shots.

9b. Subjects exposed to the medium and long shots of the weak witness did not differ significantly in their evaluations of the witness' composure.

10. Different camera shots did not significantly affect subjects' perceptions of the weak witness' safety, qualification, dynamism authority, or character.

11a. Subjects exposed to the weak witness retained significantly more information in the long shot than in either the medium or close-up shots.

11b. The amount of information retained by subjects exposed to the weak witness in the close-up and medium shots did not differ significantly, but both groups retained significantly less information than subjects who saw a long shot of the weak witness.

Summarizing the results for the weak witness, partial support was obtained for Hypothesis 23. The data did not support Hypotheses 17, 18, 19, 20, 21, 22, or 24. Moreover, given that Hypotheses 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 24 were not supported by the data, Hypothesis 25 was rejected. There was simply no consistent tendency for subjects to perceive the strong witness more favorably in the close-up shots and the weak witness more favorably in the long shots.

The results of this study indicated that subjects perceived the strong witness to be significantly more composed, qualified, and dynamic than the weak witness and subjects retained more information and expressed greater interest when exposed to a strong witness.

The significant effect of witness type on perceived composure was not particularly surprising. This measure served as a check on the manipulation of the witness variable. The findings indicated that the mean composure ratings of the strong witness were significantly greater for all three types of camera shots which demonstrated that the witness type manipulation was successful.

The effects of witness type upon perceived qualification produced an interesting pattern of relationships. An inspection of the means indicated that the strong witness was perceived more qualified than the weak witness in all camera shot conditions, but the difference was only significant in the close-up shot. Thus, the difference in the perception of the qualification of the strong and weak witnesses is primarily due to differences in the close-up condition. A plausible explanation for this result is that the close-up shot tended to emphasize the facial nonverbal cues of the witness. Some support is lent to this contention since the strong witness received his highest ratings in the close-up shot while the weak witness received his lowest ratings in the close-up shot.

The results demonstrated that subjects perceived the strong witness to be significantly more dynamic than the weak witness. An examination of the means indicated that this pattern was consistent across all camera shots. Given that dynamism reflects the delivery style of a source, this result is not surprising. Comparing the delivery style of the strong witness (i.e., assertive, attentive and unhesitant) with the delivery style of the weak witness (i.e., uncertain, fumbling, inattentive, and hesitant), one would expect the strong witness to be perceived more dynamic than the weak witness.

The amount of information retained by subjects was also influenced by witness type. Subjects exposed to the strong witness retained more information than subjects exposed to the weak witness. One possible explanation for this finding is that subjects exposed to the weak witness were distracted by his nonverbal bahavior reducing the amount of attention devoted to the testimony.

The last variable significantly affected by witness type was the subjects' expressed interest level in the proceedings. The results indicated that subjects exposed to the strong witness expressed greater interest than subjects exposed to the weak witness. An inspection of the means indicated that the pattern of differences was the same across all three camera shots, but was only significantly different in the close-up and medium shot conditions. This finding may be attributable to the dynamism ratings of the two witness types. The strong witness was perceived as significantly more dynamic than the weak witness. Clearly, it is more interesting to listen to a dynamic speaker than one who is not dynamic. Hence, it logically follows that subjects would express greater interest when viewing a strong witness as compared to a weak witness.

Somewhat perplexing is the lack of significant differences in expressed interest between the weak and strong witnesses by subjects in the long shot conditions. Conceivably, the nonverbal behavior of the weak witness was distracting which may have contributed to the lower interest ratings. Assuming this to be true, the long shot would tend to deemphasize these cues, reducing the amount of distraction and increasing interest. Some support for this contention exists because the expressed interest level increased for those subjects who viewed the weak witness in the long shot. On the other hand, the weak witness' composure ratings were highest in the close-up condition, where some nonverbal cues (e.g., facial behaviors) would be most readily apparent.

The results for the effects of camera shot upon the dependent variables associated with perceptions of the strong witness demonstrated that only perceived authority was significantly affected by the camera shots. An inspection of the means indicated that the strong witness was perceived as more authoritative in the close-up shot than in the long shot. A plausible explanation for this finding is that the close-up shot emphasized the strong witness' facial nonverbal behaviors more than the long shot. If the closer shots do emphasize these cues, the authority ratings in the medium shot should be less than the close-up, but greater than in the long shot condition. This pattern did emerge. However, interest ratings of subjects in the medium shot condition were not significantly different from participants' ratings in the close-up or long shot conditions. Therefore, the hypothesis was only partially supported.

The results revealed that the camera shots significantly influenced subjects' perceptions of the composure of the weak witness. As mentioned, the weak witness was perceived as significantly more composed in the close-up shot than in either the medium or long shots. Conceivably, the weak witness' nonverbal behavior emitted from the body caused the subjects to perceive him as less composed in the medium and long shots. These cues were not available for the subjects exposed to the close-up shot whose evaluations may have been based solely upon the weak witness' facial and vocal cues. Therefore, this difference may be attributable to differences in the number of cues available to the subjects exposed to the three types of camera shots.

The final relationship to be discussed concerns the effects of camera shots upon the amount of information retained by subjects exposed to the weak witness. The results indicated that subjects retained more information in the long shot than in either the medium or close-up shot conditions. One explanation for this finding emanates from the possible distracting nonverbal behaviors of the weak witness. As was mentioned earlier, the nonverbal cues emitted by the weak witness may have been distracting to subjects. These cues may have been emphasized by the close-up and medium shots producing more distraction among subjects in these conditions than in the long shot which would provide less detail of the witness' nonverbal behaviors. Research indicates that message recipients attempt to ignore mild distractions by concentrating more attention upon the message presented. However, the more severe a distraction, the less attention devoted to message content. If distracting stimuli that accompany a message receive more attention than the message itself, message recipients will retain less information from the message. Consequently, we would expect subjects in the close-up and medium shot conditions to retain less information than their counterparts in the long shot condition. This interpretation is tempered somewhat for the close-up condition by the relatively high witness' composure reported by subjects in that condition.

The findings from this study indicate that the three types of shots assessed influence juror perceptions of strong and weak witnesses differently. If a strong witness is videotaped and concern exists relative to the perceived authority of the witness, a close-up shot should be utilized. This would be particularly germane to expert witnesses testifying during the course of a trial. However, if juror perceptions of authority are not a salient issue for this type of witness, it does not really matter which of the three shots is used to videotape the witness.

If a weak witness who exhibits a low level of composure is to be videotaped, a close-up shot will minimize the adverse effects emanating from display of nervous behavior. However, this type of shot reduces the amount of information retained by jurors. Juror retention of testimony presented by this witness type can be maximized by using a long shot although it will adversely affect the perceived composure of the witness.

A final note concerning the selection of camera shots merits attention. The interaction effects between type of camera shot and witness type were not particularly strong. At best, five percent of the variance in juror evaluations of the strong and weak witness could be accounted for by these interactions. The importance of this five percent will obviously be determined by the nature of the trial and how critical the testimony of a videotaped witness is to the ultimate trial outcome.

GENERAL CONCLUSIONS

The research discussed in this executive summary has primarily sought to generate data bearing on the use of videotape technology in the courtroom environment. Policy decisions regarding the expanded use of videotape in the legal system hinge on a complex set of legal and social issues that extend far beyond the province of this research. Obviously, our findings relate primarily to the influence of videotaped trial materials on juror response.

The effects of videotape on a number of important juror response variables have been examined in the studies summarized here including: (1) verdict, (2) amount of award, (3) retention of trial-related information, (4) perceived attorney credibility, (5) perceived witness credibility, (6) juror evaluation of different witness types, and (7) juror veracity judgments of testimony presented. The following general conclusions are supported by the research:

1. The use of videotape in the courtroom does not significantly affect jurors' verdicts.
2. The use of videotape in the courtroom does not significantly affect the monetary awards to plaintiffs made by jurors.
3. The use of videotape significantly affects the amount of trial-related information retained by jurors during a trial.
4. Juror perceptions of attorney credibility can be significantly influenced by different editing and production techniques that are a part of available video technology.
5. Juror perceptions of witness credibility are affected by the use of videotape in the courtroom.
6. Videotaped presentations of different types of witnesses (strong and weak) affect juror evaluations of the credibility of the witness.
7. The use of videotape in the courtroom to present witness testimony does not significantly affect juror judgments of the veracity of the testimony presented.
8. The deletion of inadmissible materials from testimony does not appear to exert a strong impact on juror verdicts or juror perceptions of attorney credibility. It does appear, however, that jurors do disregard instructions to disregard inadmissible materials (a sort of double disregard effect) to the extent that the materials are frequently brought up during deliberations.
9. Within the province of the simple production techniques studied in this research, characteristics of the witness appear to exert more impact on juror response than do production decisions.

> Stated differently, the presentational skills of the witness are more important than variations in such factors as number of cameras and types of shots given the relatively rudimentary techniques studied.

Within the confines of juror responses examined in these studies, no evidence suggests that videotaped trials, when compared to their live counterparts, exercise a negative impact on the juror decision-making process. Compared to live trial jurors, those jurors who viewed a videotaped trial reported similar verdicts, had comparable perceptions of trial participants, retained at least as much trial-related information, and expressed similar levels of interest and motivation.

The research dealing with retention of trial-related information following live, black-and-white, and color videotape presentations of testimony indicated that while jurors retain significantly less trial-related information in all three modes over time, more rapid decay occurs in the live presentation. Additionally, jurors retain more central arguments and facts when exposed to black-and-white taped testimony as opposed to its more expensive color counterpart.

Findings from the study concerning the effects of introducing videotaped segments of witness testimony into an otherwise live trial indicated that certain witness characteristics influence juror perceptions of trial participants differently, depending upon whether the live or videotape medium is used to present testimony. Thus, the unidimensional use of either medium will not have a uniform effect upon juror response to all witnesses and attorneys. Additional research is needed to identify the specific source characteristics that interact with the mode of presentation to produce these diverse effects.

Regarding the use of videotape to delete inadmissible materials from trial proceedings, the research reported here reveals no significant impact on juror response caused by either the inclusion or deletion of inadmissible materials, save for the fact that jurors do frequently bring up the information during their deliberations. Since other studies have reported verdict influences and since our own research reveals a tendency to introduce the information, it strikes us as judicially prudent to delete the inadmissible materials if possible. Videotape, of course, **permits** such deletion.

Two important implications accrue from the study of various editing techniques used to delete inadmissible evidence. First, the process of editing _per se_ appears to reduce the perceived credibility of trial participants. Second, since an inverse relationship exists between distraction and perceived credibility--i.e., the more distraction introduced by a given editing technique, the less credible participants are perceived--the most efficient technique for use in the courtroom is one producing the least distraction, in this case, the clean edit.

The research conducted thus far indicates that the videotape medium does not significantly reduce juror ability to detect deceptive testimony, particularly when the testifying individual appears alone on video monitors. For use in the courtroom, the findings suggest a camera view which includes the entire head and body of the witness to maximize accurate assessment of both factual and emotional testimony. Videotaping in the more expensive color mode does not appear to aid the juror in detecting deception. Still, the relatively low accuracy levels observed in live, video, audio, and transcript presentations raise serious issues about jurors' ability to detect false testimony regardless of the mode of communication in which it is presented. Certainly the visual element in videotaped presentations appears to add little to the accuracy of veracity judgments; indeed, people who read written transcripts were consistently as accurate in detecting deception.

While some interaction between individual characteristics--i.e., physical attractiveness and nonverbal communication effectiveness--and the mode of presentation may occur, preliminary findings suggest that video production techniques do not exert dramatic effects on juror perceptions of trial participants, nor the ultimate outcome of civil litigation. It should be stressed, however, that research thus far has focused on relatively simple techniques. Moreover, since the problem is complex, the most prudent initial strategy probably lies in rules for uniform courtroom use of videotape which stipulate fixed cameras. By keeping presentational formats constant for all trial participants, questions about the influence of "editorial" judgments and the possible inequities resulting from wealthier participants retaining professional videotaping advice can be circumvented.

Finally, the color format apparently enhances the credibility of witnesses, particularly those with strong communicative skills. To the extent that a color presentation heightens this effect, it may place a greater premium on variables that are not congruent with legal norms concerning the trial decision-making process; i.e., the color format may magnify the importance of image at the expense of information.

THE SECOND TWO YEARS

The executive summary has highlighted the major findings and conclusions of our entire four year research program--i.e., research conducted under the auspices of NSF Grants #GI 38398 and #APR 75-15815. The remainder of this report describes the studies conducted during our second two years of research (APR 75-15815) in greater detail. Procedures are spelled out and data are presented both in textual and tabular descriptions. Even here, however, we have attempted to minimize jargon and to describe the studies so they can be understood and interpreted by readers from a variety of disciplines and professions.

VIDEOTAPE SEGMENTS STUDY

Major Study Question: What are the effects of introducing segments of videotaped testimony into live trials?

From time to time, witnesses are unable to testify during a trial. Many factors may prevent a witness from appearing in court to testify: illness, critical professional commitments, and having moved to another community, to name but a few. This problem has been most frequently resolved by taking a written deposition from the witness who is unable to testify at time of trial and reading it to the jurors and into the trial record. The written deposition itself is not problematic; however, the procedures employed to present the testimony contained in the deposition to the jurors may be.

The method used to read the deposition to jurors is quite simple. The attorneys involved select a person, subject to the approval of the judge, to read the witness' responses contained in the deposition. This individual is given a copy of the written deposition and takes the witness stand. Each attorney reads the questions asked of the absent witness during the deposition and the individual in the witness stand reads the absent witness' responses. There seems to be a considerable amount of latitude associated with the selection of the individual to read the witness' responses. Here lies the crux of the problem.

This procedure may introduce bias into the proceedings that adversely affects the jurors' ability to make valid assessments of the credibility of the absent witness and the veracity of the testimony presented. The nonverbal behavior and, to some extent, the paralinguistic cues of the absent witness are lost when a written deposition is taken. Moreover, it is possible that the nonverbal and paralinguistic behavior of the individual selected to read the absent witness' responses may be cognitively substituted for the absent witness' nonverbal and paralinguistic behavior. If this cognitive substitution transpires, the jurors' assessment of the credibility of the absent witness and of the veracity of the testimony presented would be significantly influenced by the individual reading the witness' responses.

The salience of nonverbal and paralinguistic cues in making assessments of a communication source's credibility and the veracity of information presented has been demonstrated to some extent by researchers including Hocking, et al. (1976) and Ekman and Friesen (1974). Data such as these combined with common sense psychological assumptions concerning potential deleterious effects experienced by jurors compelled to listen to testimony that is read to them have motivated an increasing number of attorneys to use other means of presenting this type of testimony.

The use of videotape technology to present the testimony of absent witnesses is one solution that is gaining increasing acceptance. Videotape has the capacity to preserve nonverbal and paralinguistic behavior that is lost when a written deposition is taken. However, while this method may resolve the absent witness problem, it may also introduce a new set of problems. The utility of videotape used in this capacity hinges upon its capacity to present testimony without introducing biasing effects. Unfortunately, little, if any, research has attempted to identify potentially biasing effects of videotaping unavailable witnesses.

Mass media researchers have long recognized the status-conferral function of media. Lazarsfeld and Merton (1952) note:

> ...enchanced status accrues to those who merely receive attention from the media.... The mass media bestow prestige and enhance the authority of individuals and groups by legitimizing their status. Recognition (by the media) testifies that one has arrived, that if one is important enough to have been singled out from the large anonymous masses, that one's behavior and opinions are significant enough to require public notice. (76)

Since most people rely upon television for news information, it is quite conceivable that the status-conferral effect will be activated when a witness' testimony is presented on television monitors.

If this effect generalizes to the use of videotape monitors in a courtroom setting, then the presentation of a witness' testimony via videotape, as opposed to a live appearance, will enhance the perceived credibility of the witness. Mass media studies have consistently demonstrated that television is perceived as the most credible source of information (e.g., Greenberg & Roloff, 1974). This type of biasing effect, if activated, might result in more favorable verdicts for the litigant for whom the videotaped witness testified.

Additional support for this line of reasoning arises from the novelty (from the jurors' perspective) associated with the use of videotape in this capacity. Most of the jurors who have participated in our research have never served on a jury before. We were somewhat amazed at this fact initially but have been repeatedly told by court officers, attorneys, and judges that this is quite normal. We are also becoming increasingly convinced that jurors' expectations concerning courtroom litigation are significantly shaped by courtroom drama presented on television. Given these two factors, it is reasonable to assume that jurors expect witnesses to testify live during the course of a trial and would be somewhat surprised to receive testimony presented on videotape monitors. Stated more succinctly, jurors expecting witnesses to testify live will find videotaped presentations to be novel.

Wyer (1974) has presented data suggesting that novel information exerts more influence on message recipients than commonplace information (223-227). Furthermore, although no evidence was found in his study, Wyer suggests that novelty may enhance the attention devoted to a given piece of information relative to other information presented with it. If this effect exists, it should hold not only for novel information but for information presented in a novel manner as well. Applying this reasoning specifically to videotape presentations of witness testimony, videotaped testimony should exert greater influence on jurors than live presentations in a typical live trial.

The effort justification hypothesis developed by Lawrence and Festinger (1962) provides further support for the conceptual framework developed here. According to this hypothesis, effort expenditure predisposes one to become more favoarably committed toward that for which the effort was expended. Previous research conducted by this research team (Miller, et al., 1975) consistently demonstrated that jurors retain more trial-related information from videotaped presentations as compared to live presentations. Even more intriguing is the consistent finding that juror information retention is greater for monochromatic presentations than color presentations. While there may be numerous plausible explanations for this finding, we think it may be related to the amount of information presented by these three modes of presentation and the cognitive effort needed to decode and assimilate the information presented.

The maximum amount of information, extraneous and relevant, is provided when an individual testifies live in court. When videotape is utilized, a filtering process is imposed by the mediating function of the medium. This mediation results in a loss of information requiring message recipients to expend greater effort decoding the message. While some information is lost in color presentations, the loss is more pronounced for monochromatic presentations given the absence of color. Stated another way, color presentations more closely approximate the "live" event than do black-and-white presentations. Given this reasoning and the effort justification hypothesis, we would expect jurors exposed to videotaped presentations of witnesses to be more favorably disposed toward the witnesses and the litigants for whom they testify than they would be if the witnesses testified live.

Finally, there are numerous reasons that a witness may be absent. Especially when the witness is an expert in some field, a juror might reasonably conclude that the witness' appearance on videotape results from pressing business elsewhere, i.e., the witness is an important person with numerous commitments. Consequently, videotaped testimony from such a witness would have a disproportionate impact on a juror who had reasoned in this manner, since the juror's evaluation of the witness' expertise might be inflated.

A second matter of concern to legal professionals and social scientists alike is the large set of issues involved in juror decision-making. The questions of how jurors form impressions during the course of a trial and how these impressions are translated into a jury's verdict are largely unanswered.

With respect to the former issue, some studies have been conducted. For example, Anderson (1959) derived primacy-recency predictions from linear discrepancy between the position held and the advocated attitude (French, 1956). He then tested this prediction in the context of legal arguments, finding evidence of a recency effect but no strong evidence of a primacy effect.

Some of our own research (e.g., Miller, *et al.*, 1975) has also been concerned with the individual juror's impressions, and with respect to that issue, we have primarily investigated the different uses of videotape as they shape individual juror perceptions. Clearly, other types of variables may affect juror perceptions, e.g., demographic characteristics and/or personality variables. Additionally, these variables may have indirect effects on juror decision-making; for instance, they may influence the amount and/or nature of information retained from the trial and the perceptions of the credibility of the trial participants. These variables, in turn, may exert a direct influence on juror perceptions of guilt or innocence or on the amount of award to the plaintiff when such a matter is relevant.

The process by which the impressions of individual jurors are translated into a group (jury) decision has received some research scrutiny. For example, Strodtbeck, James, and Hawkins (1957) found that the correlation between average pre-deliberation award and jury verdict increased as status increased, the correlation reaching a high value of .50 for the highest status category (716). Myers and Lamm (1976) reviewed a number of studies and concluded that they generally fit a group polarization model (605-606); i.e., the average post-deliberation decisions tended to be more extreme in the same directions as the average of the pre-deliberation decisions.

In conjunction with a growing interest in the process(es) by which individual impressions are transformed into group decisions, researchers have shown increased interest in jury composition. Specifically, can one select a set of jurors such that the probability of getting the desired verdict is maximized? If so, what are the variables which are relevant to the selection process?

Such an endeavor has interesting implications for the legal system. One image of the trial process assumes that a defendant is to be tried by his or her peers and that their decision is to be based solely upon the relevant facts in the case (Miller & Boster, 1977). However, if a set of jurors can be selected so as to yield any desired verdict, then such an assumption may be questioned, and jury decisions may be considered to be a function of a number of variables.

The present study attempts to address these issues; namely, how do individuals form impressions during the course of a trial, and how are these individual impressions transformed into a group decision--the verdict of the jury?

Procedures

The design of this study consisted of four treatments in which the medium of presentation for two expert trial witnesses was varied. In one condition both expert witnesses testified live under fairly typical court conditions. In a second condition the testimony of both expert witnesses was shown to jurors on monochromatic videotape. In a third condition the expert witness called by the plaintiff testified live, while the testimony of the expert witness called by the defendant was shown to jurors on black-and-white videotape. In the final condition the testimony of the expert witness called by the plainfiff was shown to jurors on black-and-white tape, while the expert witness called by the defendant testified live. Since jurors were assigned to one, and only one treatment, this design may be classified as a 2 x 2 (each expert witness testified in either a live or videotape medium), independent groups design.

Participants in this study were 106 Flint, Michigan, jurors drawn from the jury pool of the 68th District Court. This drawing was random for each of the four experimental conditions. Since certain participants were unable to serve (for health reasons, having moved from the district, etc.) there were unequal numbers of jurors in the four conditions: 22 jurors in the live condition and 28 jurors in each of the remaining conditions.

Upon entering the courthouse, jurors were escorted to a courtroom. This setting differed from the normal courtroom setting in two ways: (1) there were far more than the usual amount of jurors present, and (2) some videotape equipment (a camera and two monitors) was in the room. These unusual circumstances were explained by the judge who, in his opening remarks, stated that this particular trial was being conducted in cooperation with a National Science Foundation study of jury size. These remarks provided an explanation of the large number of jurors present. The judge went on to explain that the camera was being used to provide a record of the trial for the National Science Foundation researchers. He added that the present case involved a change of venue, that because of the unusual circumstances surrounding this case the National Science Foundation had heard about it, and that they had secured an agreement with the litigants that they could research the case. These instructions not only provided an explanation of the videotaped testimony in the videotape conditions--i.e., because of the change of venue the witness, or witnesses, could not be present--it also justified the fact that questionnaires were prepared in advance--i.e. this was possible because the National Science Foundation researchers had a great deal of knowledge of the case from working with the attorneys and the litigants. Finally, the judge ensured the jurors that their decision would be binding upon the litigants.

The case presented to the jurors involved an automobile accident in which the defendant admittedly was at fault. The point of contention concerned injuries. The plaintiff claimed that back injuries had been sustained as a result of the accident. The defendant claimed that the plaintiff's back problems were a result of a previous back condition; inadequate treatment; the plaintiff's negligence in following the instructions of her physician; and the plaintiff's weight problem. The trial's duration was approximately two hours and 15 minutes.

The trial participants included two physicians, one who testified for the plaintiff and the other who testified for the defendant; the wife of the plaintiff (who was the person involved in the accident); two attorneys; and the judge. The former three participants were trained actors. The attorneys included a lawyer and a law school student. The judge was a District Court Judge in the 68th District in Flint, Michigan.

When it was necessary to show videotaped testimony, the monitors were placed in clear view of the jurors and the testimony was shown by switching on a videotape recorder. This recorder was housed in a room behind the courtroom, and was out of the sight of the jurors. The tape of the relevant testimony had been made previous to the experiment.

Following presentation of the trial, the jurors were asked to fill out a questionnaire (Questionnaire 1) prior to breaking for lunch. Upon returning from lunch, the jurors were broken down into smaller juries--six-person juries were considered optimal, but adjustments were made because of problems in obtaining enough jurors--which were assigned to deliberation rooms and instructed to deliberate on the case before them. A different member of the research team was assigned to act as bailiff for each group and was able to observe these deliberations. In order to justify the unusual procedure of having several juries deliberate, jurors were instructed to elect a representative who, at the conclusion of the deliberations, would meet with the representatives from the other juries (there were five juries in each experimental condition). The jurors were further instructed that the result of the deliberation among the representatives would be binding on the litigants. When a particular jury had reached a decision, the members were told that some of the other groups were still deliberating, and were asked to fill out another questionnaire (Questionnaire 2) while they waited. When everyone had finished Questionnaire 2, the experiment was terminated, and the jurors were debriefed. Hence, the jury representatives did not meet to deliberate on the case.

Four measures were obtained from jurors in this study. Prior to serving on the jury panel, jurors received a quest[illegible]re for jury service, which contained demographic measures. Secondly, Questionnaire 1 was distribured. It consisted of: (1) several measures of award, i.e., the minimum fair award, the maximum fair award, the single most fair award, etc.; (2) measures of certainty, or confidence in, each of the award estimates; (3) a set of multiple-choice items to measure the amount of trial-related information retained; (4) credibility measures which tapped the dimensions of sociability, extroversion, composure, competence, and character; and (5) measures of the salience of issues, and whether the issues favored the plaintiff or the defendant.

During the deliberations the jurors were observed by research team members acting as bailiffs. Their observations included noting: (1) the group award, (2) time of group deliberation, (3) who was elected foreperson and/or representative, and who mentioned that the task needed to be performed, and (4) whether or not any group members mentioned any suspicion concerning the authenticity of the trial.

Finally, Questionnaire 2 was distributed. It contained: (1) post-deliberation measures of award and certainty; (2) personality measures, including Rosenberg's (1965) Self-Esteem Scale, Troldahl and Powell's (1965) short form of the Dogmatism Scale, Christie and Geis' (1970) Mach IV measure of Machiavellianism, Crowne and Marlowe's (1964) Social Desirability Scale, and Eysenck's (1953) Personality Inventory; and (3) evaluations of self as juror and of other group members as jurors.

Results

The results of this study will be presented in four parts. Initially, the effect of the mode of presenting expert witnesses will be considered. Second, other predictors of individual juror pre-deliberation award will be examined.

Next, the factors affecting jury award will be inspected. Finally, attention will be directed at predictors of individual juror, post-deliberation award.

Live versus videotape witness presentation. In assessing the impact of the mode of presenting witnesses, several dependent variables were examined. First, we will consider the effect of mode of presentation on juror pre-deliberation award. Table 1 contains the means, variances, and number of jurors for each of the four experimental conditions. From Table 1, it may be observed that for both the defendant's expert witness and the plaintiff's expert witness awards were higher (more favorable for the plaintiff) in the live presentation conditions. The results of an analysis of variance (unweighted means analysis) performed on these data show that neither of these main effects is statistically significant ($p > .05$). Further, the strength of these effects was measured using the correlation ratio, and was found to be nonexistant ($n^2 = .00$ for the main effects and the interaction effect). These results are presented in Table 2.

TABLE 1

Descriptive Statistics Summarizing the Effect of Mode of Presentation on Juror Pre-Deliberation Award*

		Defendant's Witness:		
		Live	Videotape	
Plaintiff's Witness	Live	$\overline{X}$ = 3,728 s^2= 4,584,823 N =22	$\overline{X}$ = 3,044 s^2= 8,305,636 N = 28	$\overline{X}$ = 3,386
	Videotape	$\overline{X}$ = 3,086 s^2= 8,536,798 N = 28	$\overline{X}$ = 2,642 s^2= 6,963,635 N = 28	$\overline{X}$ = 2,864
		$\overline{X}$ = 3,407	$\overline{X}$ = 2,843	$\overline{X}$ = 3,125

*Awards and variances are to nearest dollar amounts.

TABLE 2

A Summary of an Analysis of Variance (Unweighted Means Analysis) of the Effects of Mode of Presentation on Juror Pre-Deliberation Award

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	n^2
Plaintiff's Witness	7202578.10	1	7202578.10	<1	>.05	--
Defendant's Witness	8428946.17	1	8428946.17	1.14	>.05	--
Plaintiff's Witness X Defendant's Witness	380899.10	1	380899.00	<1	>.05	--
Within Groups	752358641.70	102	7376065.12			
Total	768371064.97	105	7317819.67			

A note of caution in interpreting these data is appropriate at this juncture. Recall that a high award may be interpreted as a relative success for the plaintiff and as a relative failure for the defendant; conversely, a low award may be interpreted as a relative failure for the plaintiff and a relative success for the defendant. Hence, if the data presented in Table 1 are interpreted in this fashion, the two witnesses clearly are more effective given different modes of presentation; specifically, the plaintiff's witness helps his client obtain more favorable awards when appearing on videotape.

The effects of mode of presentation upon the amount of trial-related information retained by jurors were also examined. Table 3 contains the descriptive statistics on information retention for each of the four experimental conditions. Observation of this table suggests that more testimony was retained when the plaintiff's witness appeared live, rather than via the videotape medium. However, mode of presentation made little difference with respect to the defendant's witness.

The results of an analysis of variance confirm these observations.[1] The analysis is presented in Table 4.[2] Although the effect of the mode of presenting the plaintiff's witness was statistically significant, it was not large ($\eta^2 = .05$). Certainly this effect is attenuated somewhat by the unreliability of the dependent measure ($r_{xx} = .80$); however, it is more likely that the effect is small as a result of the nature of the information retention scale. That is, the information retention scale is a composite of items designed to measure different types of information content. Some items pertain to information offered by the plaintiff, the plaintiff's attorney, the defendant, the defendant's attorney, and others to the judicial instructions. Perhaps if the effect of mode of presentation of those items pertaining only to the plaintiff's witness were considered, then a large effect would be obtained.

TABLE 3

Descriptive Statistics Summarizing the Effect of Mode of Presentation on Juror Retention of Trial-Related Information

		Defendant's Witness:		
		Live	Videotape	
Plaintiff's Witness	Live	$\overline{X} = 37.73$ $s^2 = 10.02$ $N = 22$	$\overline{X} = 32.93$ $s^2 = 27.40$ $N = 28$	$\overline{X} = 33.33$
	Videotape	$\overline{X} = 30.39$ $s^2 = 38.36$ $N = 28$	$\overline{X} = 31.41$ $s^2 = 30.10$ $N = 27$	$\overline{X} = 30.90$
		$\overline{X} = 32.06$	$\overline{X} = 32.17$	$\overline{X} = 32.12$

TABLE 4

A Summary of an Analysis of Variance of the Effect of Mode of Presentation on Juror Information Retention

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	η^2
Plaintiff's Witness	153.30	1	153.30	5.85	<.05	.05
Defendant's Witness	.42	1	.42	<1	>.05	--
Plaintiff's Witness X Defendant's Witness	23.73	1	23.73	<1	>.05	--
Within Groups	2648.10	101	26.22			
Total	2825.55	104	27.17			

An analysis of variance was performed on those information retention items (16) which measured only juror retention of information presented by the plaintiff's witness. The results of this analysis are presented in Table 5. Once again, there was a statistically significant relationship between mode of presenting the plaintiff's witness and retention of the plaintiff's witness' testimony, such that more of his testimony was retained in the live presentation conditions. The strength of the relationship as measured by the correlation ratio is somewhat larger than found when total information retention was the criterion ($\eta^2 = .09$); however, the effect is still not extremely strong. The unreliability of the dependent variable attenuates the estimated strength of effect, and in this case, there is considerably more unreliability than was measured in the total information retention scale ($r_{xx} = .64$). Correcting the correlation between mode of presenting the plaintiff's witness and retention of the plaintiff's witness' testimony results in a somewhat stronger estimated strength of relationship ($r = .38$).[3,4]

TABLE 5

A Summary of an Analysis of Variance of the Effect of Mode of Presentation on Juror Retention of the Plaintiff's Witness' Testimony

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	n^2
Plaintiff's Witness	55.95	1	55.95	10.12	<.01	.09
Defendant's Witness	0	1	0	0	>.05	--
Plaintiff's Witness X Defendant's Witness	2.10	1	2.10	<1	>.05	--
Within Groups	558.08	101	5.53			
Total	616.13	104	5.92			

It is worth noting that the same pattern of results was not found when the retention of the defendant's witness' testimony was analyzed (10 items). The descriptive statistics and the analysis of variance on this variable are presented in Tables 6 and 7, respectively. The interaction of the mode of presentation of the two expert witnesses is the only significant effect observed. The nature of this interaction is such that a greater amount of the defendant's witness' testimony is retained when the witnesses are either both presented live or both presented on videotape, as compared to the conditions in which their testimony is presented via mixed modes. The strength of the interaction is somewhat weak; however, the defendant's witness' information retention scale is not highly reliable ($r_{xx} = .50$). Correcting the correlation of the interaction term with the retention of defendant's witness' testimony yields an r=.20. This correlation (when corrected) is barely significant (p = .05).

TABLE 6

Descriptive Statistics Summarizing the Effect of Mode of Presentation on Juror Retention of the Defendant's Witness' Testimony

		Defendant's Witness		
		Live	Videotape	
Plaintiff's Witness	Live	$\overline{X} = 8.27$ $s^2 = 1.06$ $N = 22$	$\overline{X} = 7.68$ $s^2 = 3.78$ $N = 28$	$\overline{X} = 7.98$
	Videotape	$\overline{X} = 7.61$ $s^2 = 3.14$	$\overline{X} = 7.96$ $s^2 = 2.11$	$\overline{X} = 7.79$
		$\overline{X} = 7.94$	$\overline{X} = 7.82$	$\overline{X} = 7.88$

Once again, care must be taken in interpreting such data. Several points should be noted. First, the correlation is not particularly high, and it is only marginally significant. Second, it is not amenable to a simple, intuitive explanation. Finally, since a considerable number of analyses have been conducted, and since 1/20 of the effects are expected to be statistically significant by change (at $\alpha = .05$), it is possible that this particular effect primarily reflects sampling error, rather than any real relationship in the data.

TABLE 7

A Summary of an Analysis of Variance of the Effect of Mode of Presentation of Juror Retention of the Defendant's Witness' Testimony

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	η^2
Plaintiff's Witness	1.05	1	1.05	<1	>.05	--
Defendant's Witness	.38	1	.38	<1	>.05	
Plaintiff's Witness X Defendant's Witness	26.88	1	26.88	10.26	<.01	.09
Within Groups	264.86	101	2.62			
Total	293.17	104	2.82			

The relationship between mode of presentation of testimony provided by expert witnesses and jurors' perceptions of which of the litigants the evidence presented favored was also examined. The analysis of variance performed on these data failed to yield any statistically significant differences, or any effects of a large magnitude.

Finally, the effect of mode of presentation on source credibility was examined. This construct is rather diverse in the context of this trial, i.e., there are five sources to consider and each source was measured on each of five dimensions of credibility. Initially, we will consider the credibility of the plaintiff.

The mode of presenting the expert witnesses had a significant effect on the credibility of the plaintiff, such that when the plaintiff's expert witness was presented live, the plaintiff was perceived as being more credible. The analysis of variance summary, presented in Table 8, reveals that this effect is not extremely strong ($\eta^2 = .05$). Since credibility has repeatedly been shown to be a multidimensional concept, it is possible that the effect of the mode of witness presentation is restricted to one or two of the dimensions of credibility, and that this (these) effect(s) may be stronger (e.g., Berlo, Lemert & Mertz, 1969-70).

TABLE 8

A Summary of an Analysis of Variance of the Effects of Mode of Presentation on the Credibility of the Plaintiff

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	η^2
Plaintiff's Witness	262.92	1	262.92	4.76	<.05	.05
Defendant's Witness	.09	1	.09	<1	>.05	---
Plaintiff's Witness X Defendant's Witness	15.60	1	15.60	<1	>.05	---
Within Groups	5517.98	100	55.18			
Total	5796.59	103	56.28			

In general, analysis of the credibility data by dimensions supports the preceding interpretation. In the live conditions, the plaintiff was perceived as being of higher character than in the videotape conditions. A summary of an analysis of variance on the effects of mode of presentation on the plaintiff's character is presented in Table 9. Once again, the strength of the effect is not large, although it is larger than that found for the overall credibility variable ($\eta^2 = .06$). Correcting this relationship for the unreliability in the dependent variable does not increase the magnitude of the relationship to a great extent (r = .27).

TABLE 9

A Summary of an Analysis of Variance of the Effect of Mode of Presentation on the Character of the Plaintiff

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	η^2
Plaintiff's Witness	65.53	1	65.53	6.49	<.01	.06
Defendant's Witness	.51	1	.51	<1	>.05	--
Plaintiff's Witness X Defendant's Witness	0	1	0	<1	>.05	--
Within Groups	1019.21	101	10.09			
Total	1085.25	104	10.44			

An analysis of the effect of mode of presentation on the perceived credibility of the plaintiff's attorney yielded no significant differences. However, analyses of the effects of mode of presentation on the credibility of the plaintiff's witness produced several significant findings. The plaintiff's witness was perceived as being significantly more sociable, competent, of higher character, and generally more credible when presented live as opposed to being presented on videotape. Summaries of analyses of variance performed on these data are presented in Tables 10, 11, 12, and 13.

The strength of these relationships varies across the multiple dimensions of credibility. With respect to the sociability of the plaintiff's witness, the correlation ratio suggests a rather weak relationship ($\eta^2 = .06$; $r = .25$). Correcting r for the unreliability in the dependent variable fails to increase the estimated magnitude of relationship drastically ($r = .28$).

TABLE 10

A Summary of an Analysis of Variance of the Effects of Mode of Presentation on the Sociability of the Plaintiff's Witness

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	n^2
Plaintiff's Witness	65.53	1	65.53	6.96	<.05	.06
Defendant's Witness	1.77	1	1.77	<1	>.05	--
Plaintiff's Witness X Defendant's Witness	7.35	1	7.35	<1	>.05	--
Within Groups	951.04	101	9.42			
Total	1025.69	104	9.86			

TABLE 11

A Summary of an Analysis of Variance of the Effects of Mode of Presentation on the Competence of the Plaintiff's Witness

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	n^2
Plaintiff's Witness	75.86	1	75.86	13.10	<.001	.11
Defendant's Witness	15.16	1	15.16	2.62	>.05	--
Plaintiff's Witness X Defendant's Witness	1.05	1	1.05	<1	>.05	--
Within Groups	584.59	101	5.79			
Total	676.66	104	6.51			

TABLE 12

A Summary of an Analysis of Variance of the Effect of Mode of Presentation on the Character of the Plaintiff's Witness

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	n^2
Plaintiff's Witness	49.99	1	49.99	6.23	<.05	.06
Defendant's Witness	9.45	1	9.45	1.18	>.05	--
Plaintiff's Witness X Defendant's Witness	3.15	1	3.15	<1	>.05	--
Within Groups	811.13	101	8.03			
Total	873.72	104	8.04			

TABLE 13

A Summary of an Analysis of Variance of the Effects of Mode of Presentation on the Credibility of the Plaintiff's Witness

Source of Variation	Sum of Squares	df	Mean Square	F	Sig.	n^2
Plaintiff's Witness	807.52	1	807.52	12.40	<.001	.11
Defendant's Witness	16.48	1	16.48	<1	>.05	--
Plaintiff's Witness X Defendant's Witness	39.14	1	39.14	<1	>.05	--
Within Groups	6445.74	99	65.11			
Total	7308.88	102	71.66			

The mode of presentation is related to the character dimension of credibility in much the same manner (for character, $\eta^2 = .06$ and $r = .25$). Since the character dimension was found to be highly reliable ($r_{xx} = .92$) correction for attenuation had little effect on the correlation ($r = .26$).

The relationship between mode of presentation and competence is considerably stronger ($\eta^2 = .11$; $r = .35$). Since there is considerable unreliability in the competence measure ($r_{xx} = .51$), the correction for attenuation produces a large increase in the correlation ($r = .49$).

Mode of presentation is related in a similar manner to the total credibility score ($\eta^2 = .11$; $r = .34$). However, there is considerably less unreliability in the credibility measure ($r_{xx} = .82$), and hence, the correlation between these two measures ($r = .37$).

Finally, the effect of mode of presentation on juror perceptions of source credibility of the remaining two sources, the defendant's attorney and the defendant's expert witness, produced no significant differences.

Predictors of individual juror pre-deliberation award. The results presented in the previous section suggest that mode of presentation is not a strong predictor of pre-deliberation award. In this section other predictors of pre-deliberation award will be considered.

While several variables correlate significantly with pre-deliberation award, there are only two whose correlations are of a large magnitude. Initially, jurors' perceptions of the relevant issues in the case have a large effect on juror pre-deliberation award, such that as jurors increasingly perceive that the major issues in the case favor the plaintiff, their estimate of award increases ($r = .62$). Correcting this correlation for the unreliability to the issue scale ($r_{xx} = .90$) yields a corrected $\underline{r}$ of .65.

Second, jurors' perceptions of the plaintiff's character constitute a predictor of pre-deliberation award (r = .34), such that the higher jurors' perceptions of the plaintiff's character, the higher the pre-deliberation award. Correcting this correlation for the unreliability in the character scale (r_{xx} = .89) results in a corrected r of .36.

To ascertain whether there were spurious or suppressor effects, the issue variable and the plaintiff's character variable were entered into a multiple regression equation in which pre-deliberation award was regressed onto both predictors. The parameter estimates for this equation are revealing. The effect of issues remained stable (β = .03). This same result is illustrated by the obtained multiple correlation coefficient (R = .62). In this case R does not increase above the zero-order r for issues. Hence, juror perception of issues is the strongest and most stable predictor of individual pre-deliberation award for this set of data. Further, the principle of parsimony demands that the character of the plaintiff be rejected as a possible causal influence on pre-deliberation award, since it adds nothing to the prediction of the criterion when the effect of issues is controlled.

Jury award. Having examined predictors of individual pre-deliberation award, the question as to how pre-deliberation awards are translated into a group (jury) decision becomes relevant. Several variables proved to be salient to the prediction of jury award. Initially, the mean award of the individuals who comprised the jury (M) was found to be highly correlated with jury award (r = .83). In addition, the award of the jury foreperson (F) was found to be highly correlated with jury award (r = .67). In order to determine which variable was the strongest predictor of jury award, a multiple regression was performed in which jury award was regressed on both mean individual award and foreperson award. The resulting values of the parameters of the regression equation give a measure of the effect of each predictor on jury award controlling for the effect of the other predictor. This analysis clearly shows mean individual award to be a superior predictor of jury award ($\beta_m = .75$; $\beta_f = .28$; $\beta_g = .26$).

A problem with the preceding analysis, however, is that the measure of mean individual award is not independent of the measure of foreperson award, i.e., the mean individual award includes the award of the foreperson. Hence, the data were reanalyzed using a measure of mean individual award, excluding the foreperson (N). This new variable was found to correlate with group award to the same extent as foreperson award ($r = .67$). Therefore, on the basis of a multiple regression in which group award was regressed on both N and F, the parameters for each variable were found to be equal ($\beta_n = \beta_f = .55$). To get an indication of which variable was the strongest predictor, group size was again entered into the equation in order to ascertain which variable it suppressed to the greatest extent. Once again mean individual award (excluding foreperson) was found to be the best predictor ($\beta_n = .71$; $\beta_f = .65$; $\beta_g = .38$). Finally, it was discovered that knowledge of these three variables produced almost perfect prediction of group award ($R = .96$; $\overline{R} = .95$).

Individual juror post-deliberation award. Although the accuracy of prediction was not as great as with group award, a small set of variables was found to predict accurately the post-deliberation award of individual jurors. Both individual pre-deliberation award and the award of the group of which the individual was a member were found to correlate highly ($r = .66$ for both variables) with post-deliberation award. Regressing post-deliberation award onto both variables resulted in equal parameters estimates ($\beta = .49$) for both predictors. Since no suppressor variables were found in the data, it was impossible to ascertain which variable was the most powerful predictor. Knowledge of these two variables again afforded excellent prediction of the criterion ($R = .80$).

At this juncture, consideration of the effect of the group decision on subsequent individual juror post-deliberation award is instructive. The net effect of deliberation was to reduce mean individual award ($\overline{X}$ = 3,125 in the pre-deliberation data; $\overline{X}$ = 2,253 in the post-deliberation data). However, it is important to note that not all jurors lowered their estimated award after group discussion. Approximately 42 percent of the jurors lowered their award after group discussion, 35 percent remained unchanged by group discussion, and 23 percent raised their award after group discussion.

Certainly whether or not one changed, and if so, in what direction the change occurred, would largely be a result of the initial amount of aggreement in the group. The data support this notion. Of those who changed, 93 percent changed in the direction of the group decision. Of the total sample, approximately 21 percent could be considered deviants, i.e., changed away from the group decision, or refused to change toward the group decision.

Qualitative observations. Having presented the quantitative data, several notes about the experiment are in order, since they shed light upon the quantitative data. First, observations of the videotapes of the experiment provide evidence that the actors performed consistently throughout. The script was followed closely, and to the untrained eye, the nonverbal demeanor of the actors was very similar across the four experimental conditions.

Second, there was an uncontrolled component to juror response. Certainly few experiments, especially field experiments, are fortunate enough to achieve perfect experimental control. However, two occurrences will serve to illustrate some of the problems.

The plaintiff was to have had a back condition. The actress who played the plaintiff unfortunately wore shoes which had a small heel. Some jurors noticed this feature of her appearance and concluded that, "... she could not have had been in too much pain if she wears heels."

In addition, several jurors, who knew from the testimony that the plaintiff was a Ford Motor Company employee, concluded that she did not really need the money since, "... Ford would pick up the total tab." Certainly such factors could not be anticipated (and hence, measured or controlled). Furthermore, such idiosyncratic factors probably played only a small role in determining the responses of a few jurors. This fact may in part account for the inability of any variable to predict pre-deliberation award with great accuracy.

This fact also suggests the presence of substantial individual differences in the data, and certainly some treatment-by-jurors interactions. This possibility is further enhanced by observing the unequal variances in the experimental conditions for several dependent measures. In addition, it is supported by noting the different ways jurors changed their award estimates as a result of group deliberation.

Discussion

Results of this study show that the mode of presenting witnesses has an effect on a number of variables: pre-deliberation award, information retention, and source credibility. The nature of these effects, however, is not at all simple. For example, the plaintiff's witness was more effective in obtaining favorable awards for his client when he appeared live, whereas the defendant's witness was more effective in obtaining favorable awards for his client when he appeared on videotape. In addition, more of the plaintiff's witness' testimony was retained by jurors in the live conditions; however, mode of presentation did not exert a large effect on the defendant's witness' testimony. Finally, both the plaintiff and the plaintiff's witness were perceived as being considerably more credible when the plaintiff's witness was presented live, but similar results were not obtained for any of the three other trial participants. This null finding is especially surprising for the defendant's witness. In short, not only are the obtained effects in a direction opposite to those predicted, but they are also not consistent across sources.

Given these unusual data, it seems reasonable to conclude that there are source by mode of presentation interactions. Apparently, different sources possess characteristics (verbal, artifactual, affective, etc.) which are perceived differentially depending upon the type of medium on which the source is presented. In the present study, there was no attempt to measure such source characteristics. Moreover, what these specific characteristics might be is not immediately clear from viewing trial tapes. Perhaps elucidation of the construct, "communicator style" may prove to be illuminating by emphasizing such characteristics (see Norton & Warnick, 1976). At any rate, such issues raise interesting avenues for future research.

Even though mode of presentation had a statistically significant effect on pre-deliberation award, the effect was relatively small. The best predictor of pre-deliberation award was the jurors' perception of whom the relevant issues in the case favored. However, such an explanation of pre-deliberation award is unsatisfactory, for it merely implies another question: what variables allow one to predict how jurors will perceive issues? Unfortunately the data do not suggest what such variables might be, since there were few variables which correlated highly with issue perception. It has been argued that pre-deliberation award and issue perception have a random component as a result of certain idiosyncrasies of the experiment; however, this is hardly a satisfactory explanation. Once again, a satisfactory answer to this question awaits future research.

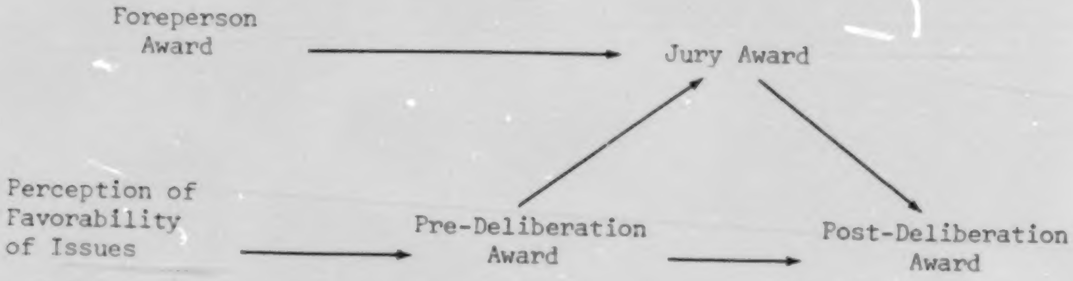
The remaining two dependent variables, jury award and post-deliberation award, were well-predicted by certain independent variables. Jury award was affected by two factors: the individual's initial evaluation of the case, as indicated by the high correlation of mean individual pre-deliberation award with jury award, and a social influence factor, as indicated by the high correlation of foreperson award with jury award; i.e., it is assumed that jury forepersons are highly influential jury members, an assumption which has been previously demonstrated to hold (Strodtbeck, *et al.*, 1957). Furthermore, the size of the group correlated negatively with jury award, and suppressed the relation of both the initial evaluation factor and the social influence factor with jury award. These findings are generally consistent with the notion of linear discrepancy theory, although the theory would have to be modified to include certain social influence effects. Little evidence to support a group polarization hypothesis was discovered.

Post-deliberation award was primarily affected by two factors: the individual juror's initial evaluation of the case and the persuasion which took place within the context of jury deliberation, as indicated by the high correlation of jury award with individual post-deliberation award. These relationships are presented visually in Figure 1.

Finally, the impact of individual differences in the data is undeniable; however, the present study has not yet uncovered the precise nature of these individual differences.

FIGURE 1

A Visual Presentation of Dependent Variables and Their Respective Predictors



DETECTING DECEPTION STUDY

Major Study Question: What are the effects of paralinguistic and nonverbal cues on jurors' evaluations of witness demeanor, credibility, and veracity of testimony presented?

During the course of a trial, witnesses of the same phenomenon may present conflicting testimony. Often, conflicting testimony may result from different perceptions on the part of the witnesses but in some instances, discrepancies in testimony may result from intentional deceit on the part of one or more witnesses. These witnesses may perjure themselves to protect friends, family, or themselves from social and/or legal recrimination or to secure undeserved monetary and material awards. The resolution of conflicting testimony and the detection of intentional distortion of information by witnesses, defendants, or plaintiffs are concerns which the legal system has attempted to satisfy through a number of various procedures. For example, cross-examination is a rhetorical means of isolating truth through the detection of unintentional or intentional distortion of information by witnesses. This procedure produces information that can be used by jurors to assess the credibility of witnesses and the veracity of testimony presented.

The use of videotape to present trial testimony has increased. Growing numbers of attorneys are utilizing videotaped depositions of witnesses unavailable to testify during trials instead of having written transcripts read to the jury. Videotaped depositions have the potential advantage of preserving for the jury witnesses' paralinguistic and nonverbal cues which might be important in any assessment of the veracity of testimony presented. On the other hand, the mediated information presented via videotape may produce systematic effects that differ from live presentations. Knowledge concerning any potential effects emanating from different modes of presentation would be useful in making choices from available alternatives as well as developing policy governing the use of videotape in the legal environment.

This study focused upon the potential effects of various modes of presentation upon jurors' abilities to detect deceptive communication presented by witnesses. For the purpose of this study, deceptive communication refers to the withholding of spontaneous behavior and/or the substitution of simulative behavior by a witness, with the intention of creating beliefs in a juror which the witness recognizes as false or invalid. The witness must consider the success of the creation of these false beliefs as important to his/her well being. The centrality of the intentionality and importance criteria to the definition can be explained through attribution theory and the work of Ekman and Friesen (1969, 1972, 1974).

Truth/deception evaluations are one judgment jurors make when evaluating the veracity of testimony presented by witnesses. According to Jones and Davis (1965) the attribution process can be understood in terms of several fundamental components. They state that before a receiver (juror) makes a judgment of an individual's behavior (witness), the receiver must perceive intention on the part of the source (witness). This conceptual focus suggests that the jurors must perceive that witnesses are aware of their behavior and the effects of their behavior upon other trial participants. Jones and Davis refer to these presuppositions as knowledge and consider them necessary factors for intention. Another correlate necessary for intention is ability, or more precisely, the receiver's judgment of the source's capacity to bring about the observed effects. In this study, these initial or antecedent conditions exist for all situations involving deceptive communication.

Sometimes witnesses unintentionally provide false information, i.e., they present information during their testimony that they believe to be true although in point of fact it is false. Jurors may perceive that the witnesses have presented false testimony but not feel that the witnesses were lying because the act was unintentional. Simply stated, the witnesses believed that the information they presented was true. Given the attribution framework adopted in this study, this type of testimony does not constitute deceptive communication.

Factors which influence the truth/deception judgments made by communication receivers may take various forms: past knowledge of the topic of discussion; personal distrust of the class, race, and/or sex of the source; past experience with the source; and so forth. What concerns us here primarily is the communicative behavior of the source, i.e., the words or actions of the source used by receivers to make truth/deception attributions about the source.

Ekman and Friesen (1969) suggest that the importance of an interaction to a source has a direct effect on his/her ability to control behaviors utilized by receivers to make truth/deception attributions. They contend that individuals can easily lie successfully about something they consider to be unimportant. The rationale for this position crystallizes when viewing deceptive communication in terms of a source withholding spontaneous behavior and/or engaging in simulative behavior to create intentionally a false belief on the part of a receiver. We do not mean to suggest that all communicative behaviors are carefully considered by a source during an interaction. Some behaviors are indeed closely monitored and are intentional while other behaviors tend to be more spontaneous and unintentional. Sources engaged in deceitful communication carefully monitor their behaviors in order to suppress any cues that would betray their dishonesty. They may substitute behaviors that are normally associated with honesty and truthfulness for the suppressed behaviors. We have chosen to label this type of activity simulative behavior.

Specifically, simulative behavior used during deceptive transactions entails: (1) substitution and/or addition of behaviors similar or parallel to those which are suppressed, i.e., those which draw attention to the fact that false or distorted information is being presented; and (2) self-monitoring by the source of simulative behavior to ensure that it is not contradicted or confounded by behaviors that tend to be more spontaneous -- not normally monitored by the source during everyday interactions. For example, we normally are more conscious of our eye movements when communicating than we are of our foot movements. Yet it is conceivable that excessive foot movements by a source may be interpreted as a sign of anxiety, leading receivers to doubt the veracity of the information being impacted upon them by the source. Consequently, if the source is to engage successfully in deceitful communication, s/he must ensure that more spontaneous cues such as foot movement are congruent with less spontaneous cues such as eye movement.

The conflict and concentration involved when the source attempts to withhold spontaneous behavior which might reveal deceit and to substitute simulative behavior does not take place during inconsequential interactions. If the source perceives the interaction to be unimportant, s/he will most likely not experience any significant amount of anxiety which produces cues suggesting deceptive communication. Consequently, there would be no need for simulative behavior and certainly little, if any, motivation for avoiding detection of deceptive communication.

Behavioral Correlates of Deception

Two lines of inquiry characterize previous research on deception. Using content analytic procedures, numerous studies have examined the verbal and nonverbal behaviors of deceivers versus non-deceivers (e.g., Exline, Thibaut, Hickey & Gumpert, 1970; Mattarazzo, Wiens, Jackson & Janaugh, 1970; Mehrabian, 1971;

Ekman & Friesen, 1972; Ekman & Friesen, 1974; Knapp, Hart & Dennis, 1974; McClintock & Hunt, 1975). Typical findings indicate that certain behavioral patterns in eye contact, facial affect, bodily movements, and verbal rate and fluency are correlated with deception. However, as Hocking (1976) has observed, "Research on visual, paralinguistic, and verbal correlates of lying and truthful behavior offers little in terms of identifying specific cues on which accurate judgments of deception may be based" (p. 29). One might add that the value of attempts to identify such cues may itself be questionable since, according to Maier and Janzen (1967), judgments of deception seem to be based on impressionistic and intuitive grounds, rather than specific behaviors. In fact, it seems unlikely that verbal and nonverbal behavioral cues function independently in signaling or "leaking" clues to deception (Ekman & Friesen, 1969); rather, the two probably function conjunctively. If so, what is needed is a method of inquiry which approaches these behaviors _holistically_, perhaps in terms of the _amount of information_ they provide for observers who attempt to make a truth/deception attribution. The present study, in part, explores this possibility.

The Detection of Deception

A second line of research has examined the extent to which untrained observers can accurately detect deception (Fay & Middleton, 1941; Hildreth, 1953; Maier & Thurber, 1968; Shulman, 1973; Ekman & Friesen, 1974; Geizer, Rarick & Soldow, 1975; Hocking, Bauchner, Kaminski & Miller, 1976). Typical findings indicate that the detection of deception is not easy under these conditions, with accuracy rates generally ranging from 40% to 60%. This is not a trivial finding. Given that the majority of our communicative transactions are _noninterpersonal_ (Miller & Steinberg, 1975), as in the case of initial interactions, a great deal more undetected deception may prevail then many of us would care to believe.

On the other hand, individual differences in "competency" as a deceiver (Fay & Middleton, 1941; Hocking, et al., 1976) and variations in the medium or channel through which the deceitful behavior is presented (Maier & Thurber, 1968; Hocking, et al., 1976) have been shown to influence judgmental accuracy. As with the behavioral correlates of deception previously discussed, it may be that the differences relate to the amount and quality of the sensory data which various channels provide. Wiener and Mehrabian (1968) have noted, "it is hardly debatable that the greater the quantity and quality of sensory channels available in a communication link, the greater the information put in, through, and out of the system" (82).

But what of these differences in the amount of information "put in, through, and out of the system?" How is such information utilized by individuals in making attributions of veracity? Do increases in available sensory data facilitate or inhibit accurate detection of deception? The literature offers very little in the way of theory or hypothetical development with respect to these issues. However, at least three possible explanations can be proposed, all of which are relevant to jurors' attempts to detect deceptive testimony.

Let us refer to the first explanation as the information utilization hypothesis, which suggests that as the amount and quality of verbal and nonverbal information available to observers increases, so should their accuracy in making attributions of truthfulness or deception. The rationale underlying this explanation suggests that, to the extent that the "richness" of available cues is directly related to increased perceptual acuity on the part of participants in deceptive transactions, they should be better able to detect signals of deceit, and thus more accurately judge the veracity of information presented by a communicator. This rationale has been offered by researchers involved with the study of teleconferencing (Ryan, 1976), and is at least implied by Ekman and Friesen

(1969, 1974) in their discussion of nonverbal leakage and clues to deception. Ekman and Friesen suggest that if a receiver not only observes behaviors originating in areas of the body having a relatively high sending capacity[5] (e.g., the face and voice), but also cues generated from areas having lower sending capacity (e.g., hands, legs, and feet), the additional information provided by the latter should facilitate detection of deception by increasing signals of its occurrence. However, Ekman and Friesen (1974) only compared the accuracy of judgments of observers who viewed the deceiver's head-only with those who viewed the body-only, thus not directly testing the information utilization hypothesis.

Hocking, et al., (1976) compared accuracy scores over a wider range of conditions, with observers viewing both factual and emotional testimony. Observers who viewed factual testimony had lower accuracy scores (49.7%) when viewing the body-only, than those viewing factual testimony in the head-only condition (53.7%) and head and body condition (54.5%). When observers heard testimony concerning the emotional state of the subjects, those in the body-only condition had higher accuracy scores (52%) than observers in either the head and body (49%) or the head-only (49%) conditions. Disregarding the not highly generalizable body-only condition, the between-camera shot findings of Hocking, et al. seem to support the knowledge utilization hypothesis. However, additional findings of highest accuracy among observers experiencing factual testimony in the audio-only (61.8%) and transcript (62.5%) conditions contradicts the hypothesis, and points to a need for more careful examination of the process surrounding the truth/deception attribution.

A second possible explanation, the distraction hypothesis, stems from research investigating the effects of distractive stimuli on persuasion and source credibility ratings. It has been argued (and in some cases found) that distractions facilitate persuasion and perceived source credibility by dividing the attention of persuadees, reducing their ability to scrutinize information impacted on them and thus increasing their susceptibility to influence (Breitrose, 1966; Dorris, 1967; Osterhouse & Brock, 1970; Keating & Brock, 1974; Brandt, 1976).

The previous rationale may be appropriated to explain some experimental findings regarding deception (Maier & Thurber, 1968; Hocking, et al., 1976). To the extent that a deceiver attempts to convince others in an interaction that his/her deceptive performance represents "normal" communicative behavior, persuasive and deceptive settings are analogous. Increasing the amount of available verbal and nonverbal cues places greater demands on receiver attention, perhaps reducing the ability to scrutinize specific behaviors. If so, then behavioral cues which are extraneous to truth/deception judgments (i.e., do not signal the occurrence of deception) may distract attention from cues which are potential indicators of its occurrence, resulting in reduced accuracy in deception detection. The authors of at least one study of deceptive communication (Maier & Thurber, 1968) have suggested a distraction effect as a possible explanation for their findings, and at this exploratory stage of research, the distraction hypothesis seems worthy of consideration.

A third alternative is referred to here as the information overload hypothesis. This hypothesis predicts results similar to those predicted by the distraction hypothesis, but with a key difference. The distraction hypothesis suggests that since receivers must attend to increasing amounts of informational stimuli, their accuracy in detecting deception is reduced because they are utilizing extraneous as well as relevant cues, resulting in inhibition of the ability to scrutinize the latter. The information overload hypothesis, on the other hand, suggests that receivers are blocking out important cues. Danowski (1974) explains that when individuals receive more information than they can process simultaneously, they experience confusion which results in higher output of error.

With respect to deceptive interactions, as visual and paralinguistic cues increase the total amount of informational stimuli with which receivers must contend, some may conceivably reach an information processing threshold and additional data may result in overload. Filtering and chunking (Danowski, 1974) are two processing strategies receivers can use to adapt to overload. Both involve the use of stereotypic cognitive referents to avoid processing all of the available data in a given setting. It may be that stereotypes of deceivers are utilized in attempting to make attributions of veracity. If such stereotypes are inaccurate, as some research suggests (Exline, *et al.*, 1970), inaccurate attributions of truth or lying could be expected. Thus, the information overload hypothesis predicts that the greater the overload on an individual receiver, as a function of increased available data from a broad spectrum sensory channel, the stronger the influence of inaccurate (not highly generalizable) stereotypes on the truth/deception attribution process, and presumably, the lower the accuracy of such attributions.

It is difficult to determine, *a priori*, which of these hypotheses is most accurate, and/or under what conditions. However, by varying the channel through which observers view truthful and deceitful communicators, obtaining estimates of the amount of verbal and nonverbal information afforded by each channel, and examining judgmental accuracy in relation to these variations, some insight may be gained. The present study, in part, attempts to explore such an approach.

Earlier it was noted that at least two studies have looked at the ability of individuals to detect deception when the channel of communication is varied. Maier and Thurber (1968) examined deception detection under live, audio-only, and transcript conditions. Hocking, *et al.* (1976) compared the accuracy of judgments of observers in videotape, audio-only, and transcript conditions. It remains to be seen how live, video, audio, and transcript conditions compare in terms of their effects on the ability to attribute truth or dishonesty. Accordingly, the present research also attempts to address this issue.

Procedures

Sources. The sources were six male and six female undergraduate students enrolled at Michigan State University who volunteered to participate in a study of "group problem-solving." Half the sources were randomly assigned to a deception condition and half to a truthful condition. Each source worked in a dyad with the experimenter's confederate, whose status was not revealed until after the experiment was completed.

Deception-inducing procedure. The procedure for inducing deception was modeled after one employed in previous research by Exline, *et al*. (1970) and Shulman (1973). Sources were told that four-, three-, and two-person groups, as well as individuals, were being asked to engage in the same task (estimating the number of dots on a series of cards), in order to examine how group problem-solving strategies related to group size. They were told that since a governmental agency was providing funds for the project, and in order to motivate interest in the task, the group in each size category with the best performance would receive $50 to divide among its members. All sources were told they had been randomly assigned to a dyadic problem-solving setting and matched with a student from another class (actually the experimenter's confederate).

Prior to the source's arrival, the confederate randomly assigned him/her to either a truthful or deceptive condition; the cheating-implication procedure was only used for sources assigned to the latter condition. In all instances, the experimenter remained "blind" to the experimental condition to avoid differential treatment of sources during the post-procedure interview. The assignment procedure controlled for sex, so that an equal number of males and females appeared in both lying and truthful conditions. This was done because previous research indicates significant differences in the ability to use nonverbal information and to detect deception as a result of varying the sex of both the source and receiver in a deceptive transaction. Accordingly, the sex of observers was also controlled so that, in the final experiment, there were equal numbers of male-male, male-female, female-male, and female-female source/receiver dyads in each condition (Fay & Middleton, 1941: Maier, 1965; Mehrabian, 1969; Mehrabian, 1971; Shulman, 1973). However, since Shulman (1973) found no effects from changing the sex of the confederate in this procedure, the same female confederate was used throughout the experiment.

The task required that the dyad jointly estimate the number of dots on a series of nine cards which the experimenter flashed in front of them for 15 seconds. After viewing each card, the source and confederate were told to confer as long as necessary to come up with one estimate for the number of dots.

At the beginning of each problem-solving session, a practice sample was presented. Then, before starting the actual problems, the experimenter mentioned that after each series of three cards she would provide the group with feedback concerning its progress by informing it of the correct answers for the completed cards. After the third card the confederate always requested this feedback, while the experimenter delayed giving it for "a couple of more trials, since you are taking so much time to decide." Between the fourth and sixth card, a second experimenter, who had been listening to the interaction via an intercom, interrupted the experimental session to inform the first experimenter that she had an "important telephone call from the director of the research project." The first experimenter left the room to "take" the alleged call.

If the source was in the truthful condition, the confederate simply engaged him/her in normal conversation during the experimenter's absence. However, if the source was in the deception condition, the confederate went through a procedure to implicate him/her in the act of cheating.

The confederate observed the folder which the experimenter had left on her chair and wondered aloud if it contained the correct answers; she complained that the experimenter had "failed to supply promised feedback" and that "she could really use the $50." Next, the confederate suggested looking in the folder and, regardless of the source's reaction, got up and began to leaf through it. Many sources helped the confederate, but regardless of their reaction, she read the correct answers aloud, identifying them as such, and jotted them down on a piece of scratch paper provided by the experimenter.

Since it was important that the first experimenter not know if the source was assigned to a lying or a truthful condition, and to ensure that she would not return until the confederate had sufficient time to enact the procedure, a means had to be developed to monitor the entire procedure. A second experimenter listened from the observation room to the conversation between the confederate and the source. After the confederate had implicated the source in an act of cheating, the second experimenter told the first experimenter she could return from the alleged telephone call. The duration of the first experimenter's absence was held constant for all sources, regardless of condition, in order to avoid cueing the experimenter as to the type of condition. The timing also served to protect the confederate's cover in that the source had little time to question the confederate before the first experimenter returned. The task was then completed, with the confederate always using the dishonestly obtained scores to make accurate estimates. In this way, unless the source reported the confederate to the experimenter (and none did) s/he was implicated in the act of cheating.

Interviewing for stimuli. After the task was completed, the experimenter took the dyad into another room to interview them concerning the strategies they used to arrive at answers to the task. The experimenter always began by interviewing the source first, under the pretense that the confederate would next be asked the same questions. The questions were as follows:

1. Please state your name.
2. What year are you in school?
3. What are you majoring in?
4. Have you ever participated in research before?
5. How many communication courses have you had?
6. Could you describe the strategy your group used to get its answers?
7. Could you be a little more specific? You really did well, especially toward the end.
8. If you had to describe to the next group what they should do to do as well as you did, what would you tell them, in two short sentences?
9. If you could choose what size group you could repeat the task in, what size would you choose, 4, 3, 2 or alone?
10. Why?
11. Is there anything else you could add about the strategy your group used?

The first five questions provided observers with a sample of the source's truthful behavior, as well as providing demographic information for future analysis. If the source was in the implication procedure, the remainder of his/her answers were untruthful, since no source had mentioned that either s/he or the confederate had cheated.

During this interview, observers viewed the sources through a one-way mirror. In addition, videotapes, audiotapes, and transcripts were constructed from a videotape shot from the same angle as the live observation and through the same one-way mirror. Besides controlling for sex of source-observer pairs, as previously mentioned, sources and observers were strangers.

Following the post-procedure interview all sources were debriefed and given detailed explanations of the study.

Observers. Eighty undergraduate students enrolled at Michigan State University participated as observers from whom judgments of veracity were obtained. Because the present study included a live condition, a rather serious procedural problem had to be overcome. The time required for briefing, participation, and debriefing of each source amounted to approximately one hour. Given 12 sources, this would have required observers in the live condition to attend a twelve-hour experimental session, which, because of fatigue and its potential contaminating effects on the experimental results, was deemed impractical. On the other hand, the time actually needed to observe and judge the veracity of sources was only about 10 to 15 minutes. Thus, in the video, audio, and transcript conditions, observers would need only 10 to 15 minutes per person. In order to minimize the time required of each observer and still ensure that s/he judged all 12 sources, observers were counterbalanced across conditions and sources using a simple Latin square design (Lindquist, 1953). Thus, all observers were required to observe three sources in each of the four conditions. Figure 2 illustrates the resulting design, which produced a total of 240 judgments of veracity (60 per condition).

After the experimenter explained the implication procedure to all observers, they saw, heard, or read the interviews of three sources in each condition, and made a judgment as to whether or not the source was lying or telling the truth. Observers in the live condition viewed interviews through a one-way mirror; during the task and implication procedure these observers remained in a separate conference room with no visual or audible access to the sources.

FIGURE 2

Counterbalancing Of Observers In Latin Square Design

Condition	Subject			
	1 2 3	4 5 6	7 8 9	10 11 12
A	LIVE	VIDEO	AUDIO	TRANSCRIPT
B	TRANSCRIPT	LIVE	VIDEO	AUDIO
C	AUDIO	TRANSCRIPT	LIVE	VIDEO
D	VIDEO	AUDIO	TRANSCRIPT	LIVE

A = 20 Observers (5 randomly assigned to each cell)

B = 20 Observers (5 randomly assigned to each cell)

C = 20 Observers (5 randomly assigned to each cell)

D = 20 Observers (5 randomly assigned to each cell)

Coders. Eight trained coders provided holistic estimates of nonverbal and total available information, with estimates based on the following definitions:

> Nonverbal information refers to the amount of information available from nonverbal behaviors such as facial expression, eye contact, nodding, hand and body movement, posture, pausing, "ums" and "ahs", and anything beyond actual words. Nonverbal information refers to how people communicate, not what they say.
>
> Total information is a holistic estimate of all available information provided by a stimulus. It is the kind of judgment you would make if I asked you which of two books or movies provided you with the most information.

Coders were cautioned that total information is not necessarily the sum of verbal and nonverbal information. Redundancy in nonverbal and verbal cues may produce a lower figure for total information than the sum of nonverbal and verbal information (Wiener & Mehrabian, 1968). For this reason, it was emphasized that the estimates should be made independently, even though the variables are not theoretically independent. Inter-coder reliability estimates were computed for nonverbal information, total information, the ratio of nonverbal to total information, and the logarithmic transformations of nonverbal and total information estimates (Cronbach, 1951). Alpha coefficients were .98, .96, .99, .99, and .98 respectively ($p<.05$).

Development of information measures and coder training. Coders were trained to make ratio-level judgments of nonverbal and total information utilizing the direct interval estimation technique. This technique may be summarized as follows:

> The standard for direct interval estimation consists of two stimuli possessing different amounts of the attribute being rated. Each is assigned a number of points, e.g., 100 and 200. The one with the smallest amount of the attribute is assigned the lowest number of points. The point assignments to the two stimuli should be approximately equal to the ratio of the amounts of the attributes they possess (Silverman & Johnston, 1975, p. 464).

This standard interval thus serves as a psychological "ruler" upon which estimates are based.

Two samples from the Hocking, et al. (1976) study were used as the standard interval for coder estimation. These samples were chosen from the original 16 sources in the Hocking, et al. study based on reported pretest values obtained from 15 undergraduates concerning available nonverbal, verbal, and total information for each segment. Two segments were selected; the mean of the first was approximately one-half the mean of the second for both nonverbal and total information, based on pretest data. Accordingly, the first segment was assigned values of 100 and 150 for nonverbal and total information, respectively, while the second segment was assigned values of 200 and 300 for nonverbal and total information, respectively. Coders then provided estimates of available nonverbal and total information for all sources via all four transmission channels.

Results

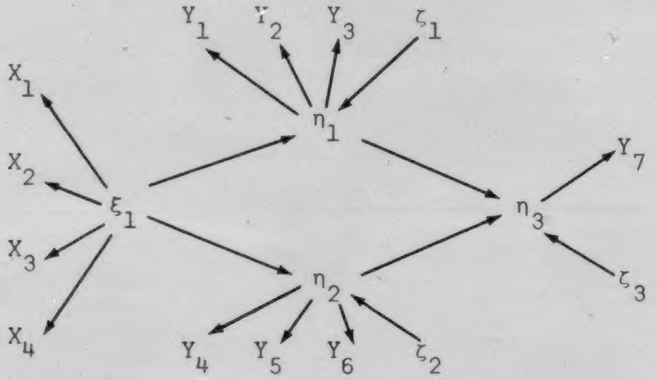
Before discussing the results of the present study, we should briefly describe the analytical tools employed, as well as the rationale for their use.

Earlier it was suggested that the availability of information, particularly nonverbal information, as a function of variations in the communication channel may affect differences in the accuracy of attributions of veracity made by observers. Thus, a model in which judgmental accuracy is the dependent variable, perceived available total and nonverbal information are intermediate endogenous variables, and the various channels are exogenous is suggested.[6] Accordingly, this model was estimated utilizing a two-stage least squares procedure (Namboodiri, Carter & Blalock, 1975).[7] A diagram of the basic model appears in Figure 3.

In addition, analysis of variance of judgmental accuracy by experimental condition and *a posteriori* comparison of cell means utilizing the Newman-Keuls

FIGURE 3

A Model of the Relation Between Accuracy, Available Information, and Channel



Where: ξ_1 = Communication Channel (True Variable)
η_1 = Available Nonverbal Information (True Variable)
η_2 = Available Total Information (True Variable)
η_3 = Ability to Attribute Truth or Deception (True Variable)
ζ_1 = Disturbance Term for η_1
ζ_2 = Disturbance Term for η_2
ζ_3 = Disturbance Term for η_3
X_1 = Live Condition (Indicator of ξ_1)
X_2 = Video Condition (Indicator of ξ_1)
X_3 = Audio Condition (Indicator of ξ_1)
X_4 = Transcript Condition (Indicator of ξ_1)
Y_1 = First Coder's Estimate of η_1
Y_2 = Second Coder's Estimate of η_1
Y_3 = Third Coder's Estimate of η_1
Y_4 = First Coder's Estimate of η_2
Y_5 = Second Coder's Estimate of η_2
Y_6 = Third Coder's Estimate of η_2
Y_7 = Observer Judgmental Accuracy

procedure were conducted. This provided a second means of examining experimental main effects, as well as facilitating simplicity of presentation.

All data were analyzed via SPSS and LISREL programs[8] by a CDC 6500 computer.

Channel variation and perceived information availability. The first stage of the two-stage least squares procedure (2SLS) consists of ordinary least squares regression. In this case, two separate equations had to be estimated; the first to determine the path coefficients between perceived nonverbal information and the exogenous variables, and the second to determine the paths between perceived available total information and the exogenous, as well as nonverbal information variables.

Table 14 summarizes the results obtained from estimation of the first stage, first equation. It was assumed earlier that variations in the communication channel would result in covariation in coders' perceptions of the amount of available nonverbal information. The results strongly support this assumption, with variations in the channel accounting for greater than .99 percent of the variance in perceived available nonverbal information. These results also serve as an indirect check of the success of the experimental procedure for manipulating available information in terms of communication channel.

It was also assumed that channel variations, as well as perceived available nonverbal information, would result in variations in coders' perceptions of available total information. Table 15 summarizes the results pertaining to this assumption. Again, the results are strongly supportive (R^2=.969), and also serve as an indirect check of the experimental procedure for controlling the availability of information, a crucial variable in the present study.

Information availability and judgmental accuracy. The results pertaining to channel variation and perceived information availability are fairly straight-

TABLE 14

First Stage, First Equation of Two-Stage Least Squares Model

Dummy-Variable Structural Model*	F	p<.05	Multiple R	R^2
$Y_2 = a + b_0U + b_1X_1 + b_2X_2 + b_3X_3 + b_{K-1}X_{K-1} + E$	27956.6	yes	.998	.997
$Y_1 = -1.30 + 3.66X_1 + 3.72X_2 + 3.46X_3$				

Variable	b	df	F	p<.05
X_1 = Live	3.66	3/236	57241.1	yes
X_2 = Video	3.72	3/236	58880.2	yes
X_3 = Audio	3.46	3/236	51165.0	yes
Y_1 = Perceived Available Nonverbal Information				

---

* See Namboodiri, Carter & Blalock (1975), pp. 138-39, for a discussion of dummy-variable regression analysis.

TABLE 15

First Stage, Second Equation of Two-Stage Least Squares Regression Model

Dummy Variable Structural Model	F	p<.05	Multiple R	R^2
$Y_2 = a + b_0U + b_1X_1 + b_2X_2 + b_3X_3 + b_4Y_1 + b_{K-1}X_{K-1} + E$	1883.92	yes	.984	.969

$$Y_2 = 3.22 - 2.64X_1 - 2.65X_2 - 2.58X_3 + 8.24Y_1$$

Variable	b	df	F	p<.05
X_1 = Live	-.264	4/235	873.07	yes
X_2 = Video	-.265	4/235	857.18	yes
X_3 = Audio	-.258	4/235	936.21	yes
Y_1 = Perceived Available Nonverbal Information	.824	4/235	1147.47	yes
Y_2 = Perceived Available Total Information				

rward and not particularly surprising. Of greater importance are the results pertaining to information availability as a predictor of the ability to make accurate attributions of veracity. By using the two-stage least squares procedure, the endogenous variables in the structural model could be "purified" in such a way that their correlations with disturbance terms were eliminated. Thus, given minimal measurement and/or sampling error, a fairly accurate estimate of the relation between information availability and observer accuracy was possible.

Table 16 summarizes the results obtained from this procedure. Examination of these results suggests that variations in availability of information cues, as a function of communication channel, do not predict judgmental accuracy very well. The multiple R was only .064, accounting for less than one percent of the variance in accuracy scores.

Channel variation and judgmental accuracy. One of the major aims of the present research was to examine the ability of observers to make accurate attributions of veracity under live, video, audio, and transcript conditions. While the results of the two-stage least squares regression obviously take such variations in communication channel into account, it is not so obvious how each affects judgmental accuracy, based on examination of these results alone. To shed further light on this issue, an analysis of variance of accuracy scores was conducted. The results, summarized in Table 17, were significant.

TABLE 17

Analysis of Variance of Accuracy by Condition

Source	Sum of Squares	df	MS	F	P
Total	59.496	239	---	---	---
Between	1.913	3	.638	2.613	<.05
Within	57.583	236	.244	---	---

TABLE 16

Second Stage, Third Equation of Two-Stage Least Squares Regression Model

Structural Model	F	$p<.05$	Multiple R	R^2
$Y_3 = a + b_1\hat{Y}_1 + b_2\hat{Y}_2 + E$	.481	no	.064	.004
$Y_3 = -.428 - .004\hat{Y}_1 + .389\hat{Y}_2$				

Variables	b	df	F	$p<.05$
$\hat{Y}_1$ = predicted perceived available nonverbal information	-.004	2/237	.825	no
$\hat{Y}_2$ = predicted perceived available total information	-.389	2/237	.956	no
Y_3 = observer judgment accuracy				

A posteriori comparisons of cell means utilizing the Newman-Keuls procedure (Winer, 1971) indicated that observers in the live condition were significantly more accurate in attributing truthfulness or deception than observers in the audio-only condition ($p<.05$). No other individual comparisons were significant.

TABLE 18

Individual Comparisons of Treatment Means*

Treatment	s.d.	Mean
Live	.499	$.567_a$
Video	.503	$.467_b$
Audio	.470	$.316_a$
Transcript	.503	$.467_c$

*Means having same subscript differ significantly at the .05 level of confidence. The higher the mean, the greater the judgmental accuracy.

Discussion

Results of the present study do not support any of the suggested hypotheses -- information utilization, information overload, or distraction. In fact, the multiple R of .064 indicates that available total information accounts for less than one percent of the variance in accuracy scores. The high accuracy in the transcript condition (46.7%) rules out any linear relationship between available nonverbal and/or total information and the ability of untrained observers to detect deception on the part of strangers. The comparatively high accuracy observed in the transcript condition also suggests that an attribute of that channel, distinct from type and amount of information, may provide an explanation. Amount of time an observer has to examine the message and the ability of an observer to re-examine the message may be two such qualities of transcripts worthy of additional inquiry. Support for such a perspective comes from at least three sources: (1) the low accuracy scores found by Maier and Thurber (1968), 58.3%, and Hocking, *et al*. (1976), 58.5%, in the conditions where information was most abundant; (2) the conclusion of Maier and Janzen (1967) that judgments of veracity "seemed to be based upon impressions rather than logic" (105); and (3) the high accuracy scores found by Maier and Thurber (1968) and Hocking, *et al*. (1976) in transcript conditions.

Considering the low accuracy scores obtained in all conditions -- 56.7% for the live, 46.7% for videotape and transcript, and 31.6% for the audio -- it is highly questionable whether untrained observers can accurately detect deception on the part of strangers. None of the mean accuracy scores differed significantly from the 50 percent criterion researchers have defined as chance accuracy in these studies. It should be noted that this criterion may be somewhat arbitrary in the sense that all people may not expect all sources to be lying 50 percent of the time. However, in the present study, sources were lying half the time and telling the truth half the time, thus making the 50 percent criterion appropriate.

A few studies (Maier & Thurber, 1968; Ekman & Friesen, 1974; Hocking, *et al*., 1976) have obtained accuracy scores significantly above the 50% criterion. However, the deception-inducing procedures employed in these studies can be criticized for problems which may inflate accuracy scores. Maier and Thurber (1968) had students "role-play" deceivers. When role-playing, lying behavior is not inconsistent with matters of known fact, i.e., deceivers act as they *believe* someone who is lying acts. When playing the part of a liar the tendency is to emphasize "lying" behaviors. Furthermore, the role player has no real motivation to succeed in the performance. Thus, such a technique, at worst, inflates the accuracy scores of observers, while at best it has been seriously questioned as a research technique, since no one seems to know whether role players know how real liars behave (Freedman, 1969).

In both the Ekman and Friesen (1974) and Hocking, et al. (1976) studies individuals always lied while observing a very unpleasant stimulus and told the truth while viewing a pleasant stimulus. This procedure systematically increased the cues of discomfort and arousal coming from the group of liars. Such cues of arousal would be attributed by observers to lying rather than other extraneous factors, since that was the explanation offered by the social context (a detecting deception study) in which observers made their attributions (Schachter & Singer, 1962). The arousal cues stemming from the unpleasant stimulus would thus have made it easier for observers to identify liars.

The deception-inducing procedure used in this study was chosen to overcome some of the criticisms of past deception-inducing techniques. We realized that a more generalizable deception-inducing technique might logically produce lower accuracy scores than role-playing or the technique involving the viewing of an unpleasant stimulus; and indeed, the resultant accuracy scores (56.7%, 46.7%, 46.7%, 31.6%) were lower than, but we believe more generalizable than, past scores. Given the criticism of past deception-inducing techniques, the generally low scores found under these past techniques, and the low scores found in the present study, the claim that untrained observers can accurately detect deception on the part of strangers is highly questionable.

Given these findings, three areas of future research may prove fruitful. All research in the area of detection of deception thus far has examined the process in terms of stranger dyads. Perhaps we should investigate deception detection in established relational settings. Miller and Steinberg (1975) suggest that when an individual engages in interpersonal communication the accuracy of predictions about the other goes up. This is because interpersonal communication involves knowledge on the part of the observer concerning the idiocyncrasies of the other and prediction dominated by *stimulus discrimination* based on this knowledge, rather than *stimulus generalization* based on stereotypes, which characterizes noninterpersonal communication (Miller & Steinberg, 1975). Miller and Steinberg's conception of interpersonal communication would predict higher accuracy on the part of observers who communicate interpersonally with the source, due to the increased knowledge those observers have concerning the source's lying and truthing behavior. Examination of accuracy in detection of deception between sources and receivers who have interpersonal relationships may prove fruitful in terms of the work of Miller and Steinberg. Hocking (1976) also suggests that lying behavior may not be the same across individuals, but rather is distinguishable from truthing behavior only within individuals, based on differences between each individual's own lying and truthing behavior. If so, detailed knowledge available to individuals in an interpersonal relationship as to the truthing behaviors of the source would be necessary to notice deviations.

The second and third lines of possible research call for careful cue analysis of videotapes of the samples of the same individual's lying and truthing behavior. Hocking's (1976) hypothesis that lying behavior is a deviation from the individual's typical truthing behavior could be examined by comparing the cue analysis of lying and truthing segments within each source, rather than across sources. Finally, knowledge concerning the stereotypes individuals have of liars could be obtained by comparing the cue analyses of segments observers judged as lying with segments observers judged as truthing.

In summary, four major findings emerged from this study:

1. No significant difference was found between the ability of observers to detect deception when testimony was presented live, on videotape, or in the form of a written transcript.
2. Findings indicate that audiotape presentation of testimony results in significantly lower accuracy in detecting deception than does a live presentation.
3. Accuracy scores for all four conditions indicate that observers, even when they have been forwarned that 50% of the time a source is lying, cannot detect deception with any high degree of proficiency.
4. The identical accuracy scores in the transcript and videotape conditions, and almost identical scores in the live condition, suggest that the visual element of a presentation may add little to an observer's ability to detect deception.

These results overall suggest that jurors evaluating the veracity of testimony presented by witnesses (or defendants or plaintiffs) during the course of a trial will probably not be able to discover false testimony with any high degree of accuracy. Further, the use of videotape to present testimony of witnesses unavailable to testify at time of trial will not have any significant effect on the jurors' judgments of the veracity of testimony presented. Consequently, a decision whether or not to use videotape to present a witness' testimony to jurors should not hinge upon this communication medium's effect upon jurors' judgments of the veracity of witness testimony.

There is one important limitation in this study that deserves attention. In the transcript condition observers read the written transcript rather than having it read to them. This, of course, deviates from normal courtroom procedures involving the use of written transcripts which entail the reading of the transcript to the jurors and into the record. This can be accomplished by placing an individual in the witness stand who reads the absent witness' responses from the transcript as the interrogating attorney reads the questions from the transcript. Quite often, the interrogating attorney will select a colleague from his own law firm to read the witness' responses. This procedure suggests the possibility of introducing bias into the proceedings by coloring (intentionally or unintentionally) the witness' responses using paralinguistic and nonverbal cues. If the communication style of the individual selected to read the absent witness' responses from the written transcript affects jurors' perceptions of the absent witness, an argument would materialize suggesting the use of an alternative mode of presentation. For this reason, we made the decision to allow the observers to read the transcript in this particular study and are in the process of investigating the potential effects that may be introduced using the procedure discussed above for presenting the testimony of a witness unavailable to testify during the course of a trial.

INADMISSIBLE EVIDENCE STUDY

Major Study Question: What are the effects of the deletion of inadmissible testimony on verdicts of six-person juries?

Proponents of videotape have argued that use of this medium will reduce the number of courtroom proceedings being declared mistrials due to intentional or unintentional remarks made by one of the trial participants in the presence of the jury. Cases could be tried and videotaped and all objectionable remarks and evidence ruled inadmissible could be edited out prior to the jury viewing the videotape (cf. Morrill, 1972; Valentino, 1972-1973; Kornblum & Rush, 1973; McCrystal, 1975; Fontes, 1975).

The number of erroneous rulings by magistrates which result in appellate reviews could be reduced through the use of videotape. Judges are often placed in the unfortunate position of making immediate rulings concerning procedural matters as well as the admissibility of evidence. As Morrill (1972) indicates, even a "most experienced judge will commit a reversible error from time to time by erroneously ruling out competent evidence or admitting incompetent evidence" (227). If trials were videotaped for presentation to jurors at a later date, judges could take more time to adequately research their rulings without fear of antagonizing jurors who, given current procedures, are compelled to sit and wait (Rush, 1973). According to Morrill (1972), judges and trial lawyers are aware that when they are compelled to retire to the judge's chambers to settle complex legal questions, "the jury will become impatient, find delays irritating, and feel that the court and lawyers are being inconsiderate of their time" (226). This could have deleterious effects upon the jurors' attitudes and affect the verdict they ultimately reach.

Proponents of the use of videotape have also argued that instances of legally inadmissible testimony may be readily edited from videotaped presentations, thus ensuring that jurors would not be exposed to potentially prejudicial information. This argument rests on the commonsense psychological assumption that even though a judge may instruct a jury to disregard inadmissible testimony or evidence, its members may choose not to do so; or, in fact, may be unable to do so. In other words, they are likely to be influenced by the inadmissible materials, regardless of admonitions from the bench.

The prospect of cliental advantage encourages some attorneys to knowingly introduce inadmissible evidence in violation of trial procedure. Trial procedure can be viewed as a set of rules governing the courtroom behavior of trial participants. These rules are complex and have been developed through an ongoing process of trial and error. The rules governing the introduction of evidence are especially important, for it is on the basis of evidence that juries and judges are supposed to make determinations of fact -- and ultimately to reach verdicts.

The potential effects of infractions of evidentiary rules upon jurors have received considerable attention from social scientists. Wanamaker (1937) found that jurors responding to a questionnaire had discussed issues during deliberation that by law should not have been discussed. His findings, however, did not demonstrate that these discussions altered trial outcomes.

Weld and Danzig (1940) exposed two juries composed of persons known to have anti-Nazi sentiments to information indicating that an individual in a trial reenactment had pro-Nazi sympathies. Only one person mentioned this information during deliberation, and he was reminded by another juror of the judge's instructions to disregard the information. This study, however, included only two juries, far too few to permit meaningful inferences. Furthermore, the objectionable evidence was not very important within the trial context which dealt with civil fraud.

Hoffman and Brodley (1952) interviewed 18 jurors after three trials in which objectionable testimony was introduced. Only one juror remembered that the evidence was not to be considered. Again, however, the number of cases investigated were too few to permit justifiable inferences. Likewise, the researchers were unable to demonstrate that consideration of the evidence had any influence on trial outcomes.

Broeder (1959) reports an experiment, conducted as part of the University of Chicago Jury Project, in which 30 mock juries were exposed to one of three versions of an automobile liability case. When the defendant disclosed that he had no liability insurance the average award among jurors was $33,000; when he disclosed that he had liability insurance the average award increased to $37,000; and when the jury was told to disregard the information that he had liability insurance the average award increased to $46,000. Although no statistical analysis of these data is provided, the observed differences seem large enough to warrant an assumption of reliability. The fascinating aspect of this study is, of course, its finding that the objection and subsequent instructions to disregard the objectionable testimony appear to have increased the testimony's impact.

Kline and Jess (1966) exposed four juries to prejudicial pretrial publicity. During deliberation, the evidence was mentioned in all four juries. In three of the juries the person mentioning the information was reminded of the judge's instruction to disregard the information, and it was not mentioned again. In the fourth jury the information was actively used in reaching a verdict. Again, the small size of the study renders the development of inferences hazardous.

Simon (1966) reports that when explicitly told to disregard prejudicial information obtained from sensationalistic newspaper accounts, jurors who read such accounts return no more guilty verdicts than do jurors who read less sensationalistic accounts. Sue, Smith, and Caldwell (1973) note, however, that the evidence introduced was not clearly important to the trial, and since it was from a newspaper it might be easier to disregard than evidence heard during the trial itself.

Mitchell and Byrne (1972) detected no differences in verdicts between persons reading a transcript in which the judge instructed them to pay special attention to certain information and one in which he directed them to disregard it. They conclude that the instructions had no effect. In a similar vein, Sue, Smith, and Caldwell (1973) had students read one-page summaries of a trial in which a single instance of objectionable testimony was introduced. An objection to this evidence was either sustained or overruled and a control condition containing no objectionable evidence was also included. The researchers found that if the other information against the defendant was weak, the objectionable evidence resulted in significantly more convictions regardless of the judge's instructions. Both of these studies involved subjects reading brief transcripts or summaries of trials, and the extent to which one can generalize from such research to actual courtroom situations is questionable.

Two studies (Fontes, Miller & Bender, 1977) investigating the relationship between the amount of objectionable evidence introduced and individual juror's verdicts, recommended awards, and perceptions of trial participants produced essentially the same results. The same curvilinear, albeit statistically nonsignificant, pattern emerged in both experiments suggesting that moderate amounts of inadmissible testimony benefitted the rule-breaking attorney's case but extreme amounts proved to be detrimental.

Given the limitations associated with some of the previous research discussed, it is difficult to determine if inadmissible evidence does significantly influence juror information processing and decision-making behavior. The research is characterized to some extent by small sample sizes and inconclusive results. It may be the case that individual juror pre-deliberation verdicts and awards are influenced by inadmissible evidence but the impact of the objectionable material is diminished through the discussion of admissible evidence during deliberation. Conversely, the influence of inadmissible evidence may perhaps be enhanced through discussions of the material during deliberation.

This study focused primarily upon the effects of inadmissible material on the deliberation process itself. Specifically, we were interested in determining if jurors disregard inadmissible evidence when instructed to do so by the presiding judge or ignore his/her instructions and discuss the material during deliberation proceedings. The following questions were pursued in this study:

1. Do jurors exposed to evidence ruled inadmissible discuss it during deliberation proceedings even though instructed to disregard it?
2. Are there differences in verdicts between juries exposed to a trial containing inadmissible evidence and juries viewing the same trial devoid of inadmissible evidence?
3. Are there differences in verdicts between juries exposed to a trial containing inadmissible evidence who discuss it during deliberation proceedings and juries who are exposed to the material but do not discuss it?

4. Are there differences in certainty of verdicts between jurors exposed to a trial containing inadmissible evidence and jurors viewing the same trial devoid of inadmissible evidence?

5. Are there differences in satisfaction with verdict between jurors exposed to a trial containing inadmissible evidence and jurors viewing the same trial devoid of inadmissible evidence?

Procedures

In an effort to achieve ecological validity, as well as generalizability of the findings, the decision was made to select a transcript of an actual trial rather than creating a mock trial. The following criteria were employed to select a transcript appropriate for this study:

1. The trial should be no longer than an hour and thirty minutes in length.

2. The evidence in the trial should be balanced, i.e., the evidence should not be heavily weighted in favor of the plaintiff or the defendant.

3. The trial should contain an average number of objections for a trial of this length or should have the potential of being altered such that the number of objections would equal the average.

The first criterion was invoked for pragmatic reasons. Since the study was to focus upon deliberation, a lengthy trial would have increased the amount of time required of subjects increasing the difficulty of obtaining an adequate sample.

The second criterion was applied in an effort to minimize biasing effects that would contaminate the dependent measures. Specifically, if the evidence in the trial were heavily weighted in favor of either the plaintiff or the defendant, a suppressor effect might be introduced into the experiment that would militate against observing any effects of inadmissible evidence.

The third criterion was employed to maximize the generalizability of the findings. This criterion was difficult to satisfy given the absence of normative data concerning the "average" number of objections that occur in trials. In an effort to generate some normative guidelines, albeit rough ones, a number of legal experts with extensive trial experience were interviewed. Their pooled estimates suggested that a typical civil trial would contain approximately six objections per hour of trial activity.

With the aid of legal experts and guided by these criteria, a trial transcript was selected. The trial involved a civil case in which the defendant was accused of conversion of funds by a bank. The original transcript contained two instances of inadmissible testimony and approximately one hour of trial testimony. The evidence presented during the original trial was not weighted heavily in favor of either the plaintiff or the defendant. Consequently, the first and second criteria were satisfied but not the third. Given that the testimony in the trial was approximately one hour in length, four additional instances of inadmissible evidence, each approximately one minute long, were constructed and inserted into the trial manuscript. In addition, the original instances of inadmissible evidence were rewritten to make them approximately one minute in length.[9] The entire transcript was edited to the extent that all references to the actual participants were deleted. The edited transcript was subsequently reviewed by the judge and two attorneys to ensure that the evidence in the trial was still balanced after the editing and the addition of the four instances of inadmissible testimony, which are summarized in Table 19.

Professional actors were recruited to play the roles of the plaintiff, defendant, witnesses, and the two attorneys.[10] The judge who originally heard the case played the role of the judge in the reenactment of the trial. The trial was reenacted in an actual courtroom and videotaped in color using a single camera and in black-and-white using a multi-camera system. (This system will be discussed in detail during our report of the multi-camera vs. single-camera production study.) A copy of the color videotape was made and electronically edited using a clean edit to remove the inadmissible material.

TABLE 19

Summary of the Six Instances of Inadmissible Testimony Included in the Trial

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1. The plaintiff's attorney summarizes in the absence of sufficient testimony a portion of evidence concerning the degree to which the plaintiff knows the defendant.
2. In response to questioning by the plaintiff's attorney, the plaintiff offers hearsay evidence and states that the defendant is dishonest.
3. The defense attorney contends that the plaintiff will lose her job if she cannot identify the individual who took the money from the bank.
4. The plaintiff's attorney objects to the defense attorney's line of questioning of a witness and accuses him of badgering the witness.
5. The plaintiff's attorney objects to a portion of evidence being entered as a matter of record without corroborating evidence.
6. The plaintiff's attorney asks the defendant to speculate about who made the transaction at the bank.

Experimental design. The full-screen color videotape was used as the stimulus for the study. Two different conditions were included, a treatment group in which participants viewed the version of the trial containing all six instances of inadmissible evidence and a control group in which participants viewed the version of the trial containing zero instances of inadmissible material.

Due to the lack of courtroom facilities and the need to unobtrusively videotape deliberations, the study was executed in a conference room in the Department of Communication at Michigan State University. The room was equipped with video recording cameras which were hidden in audio speaker boxes mounted on the walls.

Role-playing jurors. One hundred and eighty adults from the Lansing area eligible for jury duty were recruited to role-play jurors in this study and were assigned to 30, six-person juries. Fifteen juries were assigned to the control group and 15 to the treatment group. Even though participants were notified well in advance of the evening they would serve on the jury they had been assigned, a few participants contacted us on the day they had agreed to participate and indicated they would be unable to keep their commitment. These last minute cancellations necessitated the use of confederates to maintain an atmosphere of realism for the remaining five jurors who expected to serve on a six-person jury. The actual role-playing jurors were unaware that the confederates were not participants like themselves.

The confederates were trained to maintain a low profile during the deliberations so they would not influence discussions among jurors nor their verdict votes.

Measurement techniques. On the evening of their participation, the role-playing jurors reported to the conference room and completed a questionnaire focusing on demographic information. These data were used to ensure that the jurors assigned to both the treatment and control groups were comparable. The jurors then viewed the trial.

After viewing the trial and prior to beginning deliberations, the jurors elected a foreperson who polled the jury via written ballot to determine their predeliberation verdicts. The confederates voted "undecided" during this initial polling and when the foreperson announced the result of this vote, the confederates voted with the majority during subsequent pollings until a verdict was reached. These activities and the deliberation proceedings were recorded on videotape.

Once a verdict had been reached and reported to the experimenter in charge, the jurors completed a second questionnaire containing measures of satisfaction with verdict and certainty of verdict. After this questionnaire was completed, the role-playing jurors were informed they had been videotaped and were given the opportunity to have the tape erased. The reasons for the unobtrusive videotaping procedure were carefully explained to them including the possibility that they might have behaved in a different manner had they been aware of the videotaping process. None of the jurors objected to the videotaping and agreed with the necessity for the unobtrusive procedures employed. Moreover, most of them were quite enthusiastic about the research and spent considerable time reviewing the videotape record of their deliberation proceedings.

Results

Jurors exposed to inadmissible material sometimes discuss the inadmissible evidence. Eight of the 15 juries exposed to testimony ruled inadmissible discussed the evidence during their deliberation proceedings. Although no statistical tests could be performed on data germane to verdict outcomes because of small cell frequencies for guilty verdicts, it is quite apparent that jurors exposed to inadmissible evidence, whether it was discussed or not, did not report verdicts significantly different from their counterparts who were not exposed to it (Table 20). Almost all of the juries in the control and inadmissible conditions found the defendant innocent while only one jury in either condition found him guilty.

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TABLE 20

Jury Verdicts

	Inadmissible Condition	Control Condition
Innocent	12	13
Guilty	1	1
Hung	2	1
N	15	15

Even though no significant differences were observed for the certainty of verdict measure, the results approached significance (Table 21). Specifically, jurors who heard the inadmissible testimony were more confident that their verdicts were correct than their counterparts not exposed to the material ruled inadmissible.

TABLE 21

Role-Playing Jurors' Certainty of Verdicts

	Control Condition	Inadmissible Condition
$\overline{X}$	4.29	4.68
s.d.	1.41	1.32
N	83	82

$t = 1.85$, $df = 163$, $p > .05, < .08$ (two-tailed test)

Finally, there was no significant difference in satisfaction with verdict between jurors exposed to inadmissible evidence and those who were not exposed to the objectionable material.

TABLE 22

Role-Playing Jurors' Satisfaction with Verdict

	Control Condition	Inadmissible Condition
$\overline{X}$	4.90	5.11
s.d.	1.34	1.21
N	83	82

$t = 1.04$, $df = 163$, $p > .05$ (two-tailed test)

Discussion

Two important findings emerged from this study. First, juries exposed to inadmissible evidence may discuss it even though instructed to disregard it. Second, while jurors exposed to inadmissible testimony tend to be more certain that their verdicts are correct than jurors not exposed to it, the verdicts arrived at are essentially the same.

The finding that exposure to, and even discussion of, inadmissible evidence does not appear to influence verdict outcomes even though it influences certainty of verdict is subject to one note of caution. Although care was taken to ensure that a trial transcript was selected in which the evidence relevant to both the plaintiff's and defendant's cases was balanced, the number of innocent verdicts favoring the defendant indicates that the search may not have been successful.

The justification for this concern is reinforced by the relatively high level of certainty of verdict correctness expressed by all of the jurors regardless of the experimental condition in which they participated. Of course, it is possible that when compared to the plaintiff, the defendant was a more convincing witness. Had the trial proved to be more balanced, the inadmissible testimony may have influenced not only certainty of verdicts but verdict decisions as well.

EDITING TECHNIQUES STUDY

Major Study Question: What are the effects of various editing techniques used to delete inadmissible evidence or testimony from videotaped presentations on juror information processing and decision-making activities?

The evidence is becoming clearer that jurors discuss inadmissible evidence in spite of admonishments from the bench to disregard it. An overview of the findings from studies focusing upon the effects of inadmissible evidence upon juridic decisions suggests that the nature of the inadmissible material in conjunction with the strength of the admissible evidence presented during a trial determines the effects of inadmissible evidence upon verdicts. The results imply that the weaker the admissible evidence presented during a trial, the greater the impact of inadmissible testimony.

These findings aside, it is the case that trials are being videotaped in some jurisdictions and inadmissible evidence is being edited from the trials before they are viewed by juries. Procedurally, the events that transpire until the actual time the edit is made are relatively straightforward. During the course of taping a trial or a deposition, the date and time (in hours, minutes, and seconds) are recorded on the tape through the use of a piece of video equipment called a "time-date generator." Given that a judge is not normally present during tapings of testimony utilizing this procedure, should an objection be raised by either attorney, the operator simply notes the time when the objection was raised. At the conclusion of the taping, the tape and the list of objections are filed with the court. Later, the judge trying the case mounts the tape on a video playback unit in chambers and reviews the objectionable testimony, ruling upon each objection. If the objection is sustained the judge notes the time of the beginning and end of the inadmissible testimony as it appears on the tape so that it can be edited out.

The question then arises as to how this inadmissible material is to be expunged from the videotape. There are currently four different techniques that can be used to complete the editing process: (1) the clean edit, (2) the video only edit, (3) the blackout normal machine speed edit, and (4) the blackout fast forward edit. Only the last three techniques are presently being used to edit videotapes used in the courtroom.[11] The clean edit technique is not used due to time and cost considerations. These editing procedures will now be discussed in detail as well as the problems associated with their use.

The Clean Edit Technique

The clean edit technique actually removes the objectionable testimony from the videotape. The original copy is copied onto another tape, but the inadmissible testimony is left out. The equipment used to copy the original tape has the capacity to edit videotape electronically. Thus, at the appropriate time for the inadmissible evidence to be edited, the recorder is switched into the "edit" mode. At the end of the inadmissible testimony, the recorder is switched back into the "record" mode. This produces an uninterrupted tape, save for a possible momentary flick (i.e., a break in the visual pattern) in the video portion of the tape. However, this slight break in the visual pattern can be rendered virtually undetectable if the editing is done professionally.

The Video Only Technique

The video only technique entails the removal of the audio portion of the tape. In this procedure, the operator sits in the courtroom and views the trial (or deposition) on a small monitor while the jury simultaneously views the playback on larger monitors. The operator has the list of the portions of the tape that are to be edited based on the judge's rulings. Recall that the time and date have been recorded on the tape through the use of a time-date generator and while this information is not visually displayed for the jurors on the large monitors, it is visually displayed on the operator's small monitor through a simple adjustment of the horizontal hold mechanism. At the exact second the edit is to begin, the operator electronically suppresses the audio signal from the tape without affecting the video signal. Consequently, while the jury can see the visual information presented on the tape, they do not hear any of the verbal exchanges appearing on the tape. At the conclusion of the inadmissible testimony, the operator activates the audio signal and the jurors are once again able to hear the verbal exchanges. This procedure is repeated for each instance of inadmissible testimony appearing on the videotape.

The Blackout Normal Machine Speed Technique

The procedure for the blackout normal machine speed technique is the same as the procedure for the video only technique save for one exception. The operator electronically suppresses both the audio and video signals on the tape. Thus, the jury neither hears nor sees the inadmissible testimony appearing on the tape. What they do see is a black screen, much the same as if the monitors had been turned off. However, even though the audio and video signals have been suppressed on the jurors' monitors, the video signal appears on the small monitor being used by the operator. By observing the time and date information on the videotape, the operator can activate the audio and video signals directed to the jurors' monitors when the inadmissible evidence is over.

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The Blackout Fast Forward Technique

This technique is the same as the preceding technique save for one exception. In addition to electronically suppressing the video and audio signals, the operator advances the videotape at a faster speed for those portions of inadmissible evidence that last for a long period of time. The decision concerning when the tape should be fast forwarded is somewhat arbitrary. However, segments that approach thirty seconds or longer in duration are usually fast forwarded.[12]

Problems Associated With These Techniques

All of these editing techniques may be distracting to the jurors. Distraction has been conceptualized as the occurrence of "absorbing sensory stimulation" that is irrelevant to the primary message being presented (see Baron, et al., 1973, 310). Thus, for a given stimulus to be distracting, it must be noticed by the person (i.e., the person must pay attention to the stimulus) and the information conveyed by the stimulus must be unrelated to the primary message. Furthermore, information is conceptualized as any stimulus an individual processes. Therefore, noise and silence can also be considered informational cues that function as distracting stimuli.

The purpose of editing videotape trials (or depositions) is to remove irrelevant and biasing material. Ideally, the edit would be carried out in a manner such that the trial would flow continuously and the edit would not be detected by the jurors. Obviously, the editing techniques discussed earlier fail to achieve this ideal. Additionally, although the edits remove unwanted information, they themselves convey information. At a minimum, the edits indicate that something has been deleted from the videotape presentation. Given the objective of editing, this information is superfluous to the primary content of the trial. Consequently, the edits themselves may distract the jurors. Let us return to the editing techniques and see what specific elements of each technique are pertinent to distraction.

As was mentioned earlier, there is the possibility of a break in the visual pattern when using the clean edit technique. Although the actual edit lasts for a split-second, the visual image appearing on the monitors just before the edit may be quite different from the visual image immediately following the edit. The magnitude of the difference depends, of course, upon how much movement among the trial participants occurred during the edited segment. Possibly the facial expressions of trial participants will differ or their physical positions in the courtroom may change. Any sudden shift in visual orientation (i.e., "unnatural" appearing movements of participants) may be distracting to jurors.

When using the video only technique, additional distracting elements are present. Recall that in this procedure the audio signal is suppressed without affecting the video signal. Thus, when this technique is employed, jurors are able to see the trial participants' movements but unable to hear anything that is being said. The sudden loss of audio information, with the retention of visual information, constitutes an "unnatural" occurrence. An additional problem concerning the interpretation of nonverbal behaviors will be discussed in more detail later.

The two blackout techniques alleviate the problem emanating from the presentation of visual stimuli when using the video only technique. Nevertheless, use of either technique disrupts the continuity of the trial. Jurors lose both visual and audio information. This loss constitutes information -- superfluous information given our conceptual focus.

When using either of these blackout techniques, the length of the edit must also be considered. Obviously, if the same material were edited using both techniques, the duration of the edit would be shorter using the blackout fast forward technique than when using the blackout normal machine speed edit. One factor that influences the extent to which a stimulus is perceived as distracting is the length of time the receiver is exposed to it (Baron, *et al.*, 1973). Perhaps distracting stimuli lasting for short time periods have no significant effect upon jurors. Although we would expect the blackout fast forward technique to be less distracting than the blackout normal machine speed technique, there are presently no data to confirm our expectation. Additionally, knowledge concerning *how* distracting stimuli affect juror information processing and decision-making activities would be useful when making a decision concerning which editing technique to use.

While not directly applicable to our present concern, research on distraction and persuasion suggests some potential effects that distraction emanating from editing procedures may have upon jurors. Unfortunately, previous research focusing on the distraction variable has produced seemingly inconsistent results. For example, distraction has been found both to increase the persuasibility of a message (Festinger & Maccoby, 1964; Rosenblatt, 1966; Shamo & Meador, 1969) and to decrease it (Gardner, 1966; Miller & Levy, 1967; Vohs & Garrett, 1968), to enhance the credibility of a speaker (Freedman & Sears, 1965) and to decrease it (Miller & Levy, 1967), and to increase recall of message content (Silverman & Regula, 1968) and to decrease it (Vohs, 1964; Gardner, 1966; Haaland & Vankatesan, 1968).

Although the studies cited above report inconsistent findings, there is a plausible explanation for the discrepancy. Baron, *et al.* (1973) report that the effects of distraction are mediated by a number of factors including the perceived credibility of a source prior to the distraction and whether or not the distracting stimuli can be ignored. The first factor may account for the discrepant findings in those studies involving credibility, while the second may explain discrepancies concerning the persuasive impact of a message and the recall of message content (Baron, *et al.*, 1973).

There are important differences between the research on distraction discussed above and our concern about the potential distraction effects of various editing techniques. In most prior studies, the source of distraction was something other than a message itself. When editing videotape, the distraction occurs in the same medium as the message. Moreover, in previous studies there was only one message source, while in a videotaped trial, there are numerous sources. Given these differences, coupled with the numerous factors that influence distraction, predicting the effects of these editing techniques on the jury is problematic.

In addition to the problems of distraction, the two remaining editing techniques pose additional problems. Use of the clean edit technique introduces a cost problem. As mentioned earlier, this technique involves a special machine that edits videotape electronically. Presently, the cost of electronic editors, as well as technicians to operate them, is substantial. Furthermore, the time involved in performing this editing technique is much greater than for the other three.

Then, too, the clean edit is the only technique that actually removes inadmissible testimony from the tape. Granted, the original copy remains intact, but it would not be shown to the jury. This procedure raises the concern of doctoring the tape. With proper care, videotapes can be edited so that the edit is virtually undetectable. In fact, computerized editors are currently available that edit out professionally so that the edits would not be detectable. One solution to this problem would be to have the editing done in the presence of both attorneys and the judge. The tape would then be locked up until the jury was to view the trial.

The final technique to be considered is the video only edit. As mentioned earlier, the use of this editing procedure involves the electronic suppression of the audio signal from the videotape. While edits using this procedure eliminate verbal information, the nonverbal behavior is viewed by the jurors. Ekman and Friesen (1974) found that people can detect deceptive communication from the nonverbal behavior of another person. Extending the Ekman and Friesen research, Hocking, et al., (1976) found that people use facial cues to assess the veracity of factual information and bodily cues to assess the veracity of emotional information.

Clearly, nonverbal information is still being presented to the jury when the video portion is shown, though it is difficult to predict how jurors might use this information. Much would depend on the nature of the trial, the events transpiring up to the point of the edit, who was on camera during the edit, and what they were doing.

Thus far, the major problems associated with the use of each of the editing techniques have been identified. It has been suggested that all of these techniques may be distracting, and that the video only edit has the additional problem of conveying nonverbal information displayed during the presentation of inadmissible testimony. Although these techniques may have differing effects on the jury, a strong theoretical base for predictions does not exist. Consequently, this study was question-centered, rather than hypothesis-centered. Specifically, the following questions were examined:

1. Do jurors exposed to different editing techniques demonstrate differences in retention of trial-related information?
2. Do jurors exposed to different editing techniques demonstrate differences in their assessment of the attorneys' credibility?
3. Do jurors exposed to different editing techniques demonstrate differences in their assessments of the witnesses' credibility?

4. Do jurors exposed to different editing techniques report differing levels of distraction?

5. Do jurors exposed to different editing techniques report different verdicts?

Procedures

The full-screen color videotape of the trial used in the inadmissible materials study was employed in this experiment. Five different versions of the trial were used. The first version was the no edit tape in which none of the inadmissible evidence was deleted. A second version was created by electronically editing out the inadmissible material using the clean edit procedure. The remaining three versions of the trial entailed the deletion of inadmissible evidence using the video only technique, the blackout normal machine speed technique, and the blackout fast forward technique respectively. These edits were executed during three different presentations of the trial to three different groups of jurors.

Experimental design. A one-by-five factorial design was employed for this study. The four editing techniques constituted four of the cells with the fifth cell consisting of a no edit condition. Jurors assigned to this condition were exposed to the inadmissible evidence. The no edit condition was included to serve as a control group.

Jurors. To ensure maximum generalizability of the findings, the decision was made to use actual jurors who viewed the videotapes in an actual courtroom and received instructions from an actual judge. This procedure was adopted to ensure that the jurors believed they were participating in a real trial. The Honorable Bruce Fox, 66th District Court Judge of Shiawassee County, Corunna, Michigan, assisted with the study. Two hundred and twenty five jurors drawn from the active jury list in Shiawassee County were randomly assigned to one of the five experimental conditions and were summoned by the court to report for jury duty on one of five days, 45 jurors for each day. As was expected, some jurors requested to be excused from jury duty, and they were excused by Judge Fox. The actual number of participating jurors is reported in Table 23.

All of the jurors in each condition viewed the trial at the same time. Utilizing the following cover story, Judge Fox explained why so many jurors were present:

> Ladies and gentlemen of the jury: As I am sure you are aware, there has been considerable recent interest in finding ways to ensure the fairest possible trial for persons involved in legal proceedings. Both parties involved in the case you are about to see today have agreed to allow the case to be tried using a much larger jury than is usually employed and they have agreed to allow the outcome of the case to be analyzed as part of a research project underwritten by an agency of the Federal Government. The purpose of this endeavor is to allow a more representative set of viewpoints to figure into the verdict to see what effect this larger jury size has on the total range of individual views of the case.

The cover story also explained the questionnaire that was administered to the jurors at the end of the trial.

TABLE 23

Number of Jurors for Each Condition by Sex
(N = 147)

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only
Males	16	16	12	14	11
Females	20	14	17	10	17
Total	36	30	29	24	28

The Judge then went on to explain that the trial was to be presented by videotape, that it had been taped before a judge in Lansing, and that it was being shown in Corunna due to a large jury-case backlog in Lansing. The Judge's instructions were the same for all five conditions save for slight changes to accomodate the particular editing technique used on a given day.

After the judge finished instructing the jurors, he left the courtroom to conduct other court business while the jurors watched the videotaped trial. The video technician operating the video equipment and the court clerk, Mr. Howard Hanchett, remained in the courtroom while the jurors watched the trial. Two videotape monitors were used for the playback to ensure that everyone could see and hear the trial.

At the conclusion of the trial, the judge returned to the courtroom and instructed the jurors regarding their pending deliberations and the law that was applicable to this case. The judge also asked that the jurors complete a questionnaire prior to deliberating. The jurors were then randomly assigned to six-person juries and escorted to deliberation rooms located in the courthouse.[14] The jurors had been instructed to return their verdicts to the court clerk and were told that the majority verdict would be binding in the case. They were also told that in the event there was an equal number of verdicts for the plaintiff and the defendant, the court would consider this outcome the same as a hung jury. After each jury finished their deliberations and reported their verdicts to the court clerk, they were asked to complete one final questionnaire. The jurors were then fully debriefed and paid their normal per diem and mileage costs.

Measurement techniques. This study focused upon the effects of various editing techniques upon the amount of information retained by jurors, jurors' perceptions of the credibility of trial participants, the level of distraction experienced by jurors, and the verdicts arrived at by jurors.

The amount of information retained by jurors was conceptually defined as the amount of information presented by the trial participants that a juror could remember at the conclusion of a trial. The construct was operationalized (measured) in the following manner. Forty-six multiple choice questions were constructed concerning the testimony presented during the trial. The items were pretested using a sample of undergraduate students enrolled in communication courses at Michigan State University (N = 34). The students were shown the videotaped trial in which no editing techniques were used. They then responded to the 46 information retention items. The items were divided into five subtests based on the participant who offered the information in the trial. Thus, there was one test for the information presented by each of the attorneys, the plaintiff, the defendant, and the witness who testified during the trial. These data were subjected to an item analysis and those items demonstrating low reliabilities were eliminated, resulting in a 40-item test. Alpha coefficients, computed for the items of each test, are reported in Table 24.

Given the magnitude of the alpha coefficients reported in Table 24, the decision was made to use a general test of information retention. An item analysis was performed using all 40 items. Items which demonstrated low reliabilities were culled. Twenty-seven items were retained. The resulting alpha coefficient for these 27 items was .76.

TABLE 24

Alpha Coefficients for the Information Retention Items for Each Subtest

Test	Alpha Level
Plaintiff's Attorney	.48
Defense Attorney	.20
Defendant	.42
Plaintiff	.51
Security Guard	.30

Jurors' perceptions of the credibility of trial participants was conceptualized as the juror's evaluation of the performance of the participants in the trial based on the following three dimensions: (1) trustworthiness, (2) expertise, and (3) dynamism. The scales used in the operationalization (measurement) were identical to those used by Fontes (1975) and were a combination of semantic differential scales developed by Berlo, Lemert, and Mertz (1969-1970) and McCroskey (1966). The trustworthiness scales were trustworthy-untrustworthy, just-unjust, honest-dishonest, good-bad, and safe-dangerous; the expertise scales were expert-ignorant, capable-incapable, trained-untrained, knowledgeable-unknowledgeable, and competent-incompetent; and the dynamism scales were energetic-tired, aggressive-meek, decisive-indecisive, bold-timid, and active-passive. All of the semantic differentials were rated on a seven-point scale. A semantic differential scale is formed by separating a set of bipolar adjectives by a line which is divided into seven intervals. For example:

aggressive ___:___:___:___:___:___:___ meek

The jurors' task was to place a check in the interval which best expressed their opinion of the trial participant being evaluated.

Distraction was conceptually defined as the occurrence of absorbing sensory stimulation that is irrelevant to the primary message being presented. It was measured by utilizing a seven-point scale. Jurors assigned to the four conditions in which edits appeared were asked to respond to the following items:

> How distracting was the editing technique that was used to remove the testimony that was ruled inadmissible by the judge?
>
> Extremely distracting ___:___:___:___:___:___:___ Not at all distracting

Subjects participating in the no edit condition responded to this item:

> How distracting were the objections that were raised by the attorneys during the trial?
>
> Extremely distracting ___:___:___:___:___:___:___ Not at all distracting

Verdict was conceptually defined as the decision reached by a juror concerning whether the defendant was guilty or innocent of the charge of conversion of bank funds. The operationalization consisted of having the jurors indicate whether the defendant was guilty or innocent.

Results

This section discusses the results of the data analyses for each of the five questions discussed earlier. The five research questions will be considered one at a time. For all statistical tests, the .05 level of significance was used.

Question 1: Do jurors exposed to different editing techniques demonstrate differences in retention of trial-related information?

The mean retention scores for jurors in the various editing conditions are reported in Table 25. A one-way analysis of variance was used to test the relationship between the different editing techniques and the amount of information retained by jurors. The results indicated that there are no significant differences in the amount of trial-related information retained by jurors exposed to the four types of editing techniques.

TABLE 25

Means and Analysis of Variance Summary of the Effects of Differing Editing Techniques on Retained Information

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only
$\overline{X}$	18.75	17.84	19.10	19.17	19.89
N	35	31	29	24	28

Source	Sum of Squares	df	Mean Square	F
Between	33.984	4	8.496	*.513
Within	2349.532	142	16.546	
Total	2383.516	146		

* $p > .05$

Question 2: Do jurors exposed to different editing techniques demonstrate differences in their assessments of the attorneys' credibility?

The relationship between the different editing techniques and jurors' assessments of the attorneys' credibility was tested using a one-way analysis of variance. The mean credibility scores for the plaintiff's attorney and results of this analysis are reported in Table 26. The analysis yielded a significant F of 4.51.

TABLE 26

Means and Analysis of Variance Summary of the Effects of Differing Editing Techniques on the Assessment of the Plaintiff's Attorney's Credibility*

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only
$\bar{X}$	85.35_a	75.04_b	78.18_b	71.14_b	72.92_b
N	29	23	28	21	24

Source	Sum of Squares	df	Mean Square	F
Between	3266.332	4	816.583	**4.510
Within	21728.020	120	181.067	
Total	24994.352	124		

* Means with different subscripts are significantly different from each other.

** $p < .002$

An inspection of the means indicated that the plaintiff's attorney was perceived as being most credible in the no edit condition. A posteriori comparisons of cell means were computed utilizing a Dunnett t-test[15] and the Newman-Keuls test for significance.

The Dunnett t-test is appropriate for designs which contain a control group (Winer, 1971). In this experiment, the no edit condition closely approximates a live trial. It is the only condition that keeps the trial-related information intact. The other four conditions are all deviations from the no edit condition. Therefore, the decision was made to use the no edit condition as a baseline from which all other comparisons would be made.

Still, while the Dunnett t-test is appropriate for comparing experimental conditions with a control condition, it is not appropriate for comparing the experimental conditions with each other. Thus, the Newman-Keuls procedure was utilized to yield information about the relationship between the experimental conditions.

The results of the Dunnett t-test indicated that each of the experimental conditions differs significantly from the no edit condition; specifically, credibility is lower in the experimental conditions. Results of the Newman-Keuls test indicated that the experimental conditions do not differ significantly from each other.

The mean credibility ratings for the defense attorney are reported in Table 27. The analysis of variance yielded no significant differences among the ratings of defense attorney credibility reported by the various groups.

TABLE 27

Means and Analysis of Variance Summary of the Effects of Differing Editing Techniques on the Assessment of the Defense Attorney's Credibility

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only
$\bar{X}$	82.55	75.00	78.46	75.86	75.15
N	31	25	26	21	26

Source	Sum of Squares	df	Mean Square	F
Between	1171.270	4	292.818	*.151
Within	21177.055	124	170.783	
Total	22348.325	128		

* $p > .05$

Question 3: Do jurors exposed to different editing techniques demonstrate differences in their assessment of the witnesses' credibility?

A one-way analysis of variance was used to test the relationship between the different editing techniques and jurors' assessments of the witnesses' credibility. The mean credibility ratings for the defendant and the results of the nonsignificant analysis of variance are reported in Table 28.

The mean credibility ratings for the plaintiff and the results of the analysis are reported in Table 29. The results indicated that the ratings of the plaintiff's credibility did not differ significantly among treatment groups.

TABLE 28

Means and Analysis of Variance Summary of the Effects of Differing Editing Techniques on the Assessment of the Defendant's Credibility

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only
$\overline{X}$	70.77	62.60	63.69	62.67	67.50
N	31	23	26	22	24

Source	Sum of Squares	df	Mean Square	F
Between	1465.161	4	366.290	*2.162
Within	20500.974	121	169.430	
Total	21966.135	125		

* $p > .05$

The mean credibility ratings for the bank security guard (who was a witness in the trial) and the results of the analysis of variance are reported in Table 30. Again, the analysis yielded no significant differences.

Question 4: Do jurors exposed to different editing techniques report differing levels of distraction?

A one-way analysis of variance was used to test the relationship between the different editing techniques and reported levels of distraction. Mean distraction scores for each condition are reported in Table 31. The results of the analysis of variance indicated that the mean ratings of distraction differed significantly in the various conditions (see Table 31).

TABLE 29

Means and Analysis of Variance Summary of the Effects
of Differing Editing Techniques on the Assessment
of the Plaintiff's Credibility

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only
$\overline{X}$	79.34	75.36	76.00	70.50	70.46
N	32	26	28	20	26

Source	Sum of Squares	df	Mean Square	F
Between	1575.678	4	393.919	*2.105
Within	23762.565	127	187.107	
Total	25338.243	131		

* $p > .05$

An inspection of the means indicated that the no edit condition was perceived as least distracting by the jurors. When considering the four editing techniques, the clean edit technique was perceived as least distracting, while the video only technique was perceived as most distracting. The no edit condition and the four editing techniques appear in the following sequence when arranged in order from least distracting to most distracting: (1) no edit;

(2) clean edit; (3) blackout fast forward; (4) blackout normal machine speed; and (5) video only.

TABLE 30

Means and Analysis of Variance Summary of the Effects of Differing Editing Techniques on the Assessment of the Security Guard's Credibility

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only
$\bar{X}$	75.81	67.90	71.38	71.38	70.84
N	32	24	28	21	25

Source	Sum of Squares	df	Mean Square	F
Between	916.228	4	229.057	*1.13
Within	25240.241	125	201.922	
Total	26156.469	129		

* $p > .05$

A posteriori comparisons were computed utilizing the Dunnett t-test and Newman-Keuls procedure to test for significant differences between cell means. Using the no edit condition as a baseline for comparison, the results of the Dunnett t-test indicated that the clean edit condition was not significantly different from the no edit condition. The remaining three conditions were significantly different from the no edit condition.

Results of the Newman-Keuls test indicated that the blackout fast forward condition did not differ significantly from the clean edit condition in the amount of distraction reported. However, the blackout normal machine speed and the video only conditions were perceived as being significantly more distracting than the clean edit condition. The blackout normal machine speed condition did not differ significantly from the blackout fast forward condition. The video only condition was perceived as being significantly more distracting than the blackout fast forward condition. No significant differences were found between the blackout normal machine speed condition and the video only condition. Thus, when the conditions are ordered from least distracting to most distracting, any two adjacent conditions were not found to be significantly different from each other. All other possible comparisons were found to be significantly different (see Table 32).

TABLE 31

Means and Analysis of Variance Summary of the Effects of Differing Editing Techniques on Reported Levels of Distraction*

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only
$\overline{X}$	2.38_{a}	3.33_{ab}	3.82_{bc}	4.91_{cd}	5.30_{d}
N	34	27	28	23	27

Source	Sum of Squares	df	Mean Square	F
Between	162.926	4	40.731	**10.627
Within	513.592	134	3.833	
Total	676.518	137		

* Means with a common letter do not differ significantly.

** $p < .001$

TABLE 32

Differences in the Magnitude of Distraction Reported by the Jurors in Each Condition

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed
Clean Edit	No Significant Difference			
Blackout Fast Forward	Significant Difference	No Significant Difference		
Blackout Normal Machine Speed	Significant Difference	Significant Difference	No Significant Difference	
Video Only	Significant Difference	Significant Difference	Significant Difference	No Significant Difference

Question 5: Do jurors exposed to different editing techniques report different verdicts?

The verdicts reported by the jurors in each condition are shown in Table 33. A chi-square test was utilized to assess the relationship between the different editing techniques and the verdicts reported by the jurors. The results indicated that the relationship between these variables was not significant ($\chi^2 = 4.653$, $df = 4$, $p > .05$).

TABLE 33

Frequencies of Verdict for each Condition

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only
Guilty	10	9	7	7	14
Innocent	23	16	19	16	13

Table 34 summarizes the findings for the following variables: (1) information retention, (2) credibility, and (3) distraction.

In view of the findings discussed thus far, interest was generated concerning three additional questions. First, given that the editing techniques had a significant effect on the amount of distraction reported by the jurors, how might distraction be related to the credibility ratings of the trial participants? Second, what is the relationship between distraction and verdict? Third, what is the relationship between distraction and information retention?

TABLE 34

Summary of Means, F Values, Degrees of Freedom, P Value for Information Retention, Credibility, and Distraction

	No Edit	Clean Edit	Blackout Fast Forward	Blackout Normal Machine Speed	Video Only	F	df	P
Information Retention	18.75 (35)	17.84 (31)	19.10 (29)	19.17 (24)	19.89 (28)	.513	142	.726
Credibility:								
Plaintiff's Attorney	85.35 (29)	79.04 (23)	78.18 (28)	71.14 (21)	72.92 (24)	4.510	120	.002
Defense Attorney	82.55 (31)	75.00 (25)	78.46 (26)	75.86 (21)	75.15 (26)	.151	124	.151
Defendant	70.77 (31)	62.60 (23)	63.69 (26)	62.27 (22)	67.50 (24)	2.162	121	.077
Plaintiff	79.34 (32)	73.65 (26)	76.00 (28)	70.50 (20)	70.46 (26)	2.105	127	.084
Security Guard	75.81 (32)	67.90 (24)	71.36 (28)	71.38 (21)	70.84 (25)	1.130	125	.343
Distraction	2.38 (34)	3.33 (27)	3.82 (28)	4.91 (23)	5.30 (27)	10.627	134	.001

NOTE: The numbers in parentheses indicate the number of respondents.

Pearson Product-Moment correlations were computed to assess the relationship between distraction and credibility, distraction and verdict, and distraction and information retention. The results of these analyses are shown in Table 35.

TABLE 35

Pearson Product-Moment Correlations
for the Variables of Credibility, Verdict,
Information Retention, and Distraction

Variable	Distraction	n
Credibility:		
Plaintiff's Attorney	-.2245**	121
Defense Attorney	-.2414**	125
Defendant	-.1164	122
Plaintiff	-.2596**	127
Security Guard	-.1798*	126
Verdict	-.0092	128
Information Retention	-.0978	139

* $p < .05$

** $p < .01$

Results indicate that distraction is significantly related to the credibility ratings of both attorneys, the plaintiff, and the security guard, such that as distraction increases, credibility decreases. Distraction was not significantly related to the defendant's credibility. However, the negative correlation reflects the same trend found between distraction and the credibility ratings of the other trial participants.

Finally, the following relationships were examined: (1) credibility and verdict and (2) information retention and verdict by means of Pearson Product-Moment correlations (Table 36). A negative correlation with verdict indicates finding in favor of the plaintiff, while a positive correlation indicates finding in favor of the defendant.

TABLE 36

Pearson Product-Moment Correlations for the Variables of Credibility, Information Retention, and Verdict

Variable	Verdict	n
Credibility:		
Plaintiff's Attorney	-.0815	117
Defense Attorney	.0991	121
Defendant	.2879**	118
Plaintiff	-.3894***	124
Security Guard	-.2126*	122
Information Retention		

* $p < .05$
** $p < .01$
*** $p < .001$

The results indicate that verdict is significantly related to the credibility of the three individuals who testified during the trial. The greater the magnitude of the perceived credibility of the plaintiff, the greater the likelihood of a verdict for the plaintiff. Verdict was also related to the perceived credibility of the plaintiff's witness, the security guard. The greater the magnitude of the perceived credibility of this witness, the greater the likelihood of a verdict that favored the plaintiff. The same relationship was observed between verdict and jurors' perceptions of the credibility of the defendant. Specifically, the greater the magnitude of the perceived credibility of the defendant, the greater the likelihood of a verdict in favor of the defendant. No other relationships were significant indicating that verdict is not significantly related to the amount of trial information retained by jurors nor their perceptions of attorney credibility.

Discussion

The present study examined the effects of differing editing techniques on juror information retention, jurors' perceptions of the credibility of trial participants, the level of distraction experienced by jurors, and juror verdicts. The results indicate that among these variables, a number of significant relationships exist in addition to those just discussed.

The data clearly indicate that a relationship exists between the various editing techniques and the perceived credibility of the plaintiff's attorney. Comparisons of the cell means show that the four editing techniques are significantly different from the no edit condition, but not significantly different from each other. In addition, the relationship is such that the plaintiff's attorney's credibility decreases in the edited conditions. This suggests at a minimum that the mere act of editing affects jurors' perceptions of credibility, at least for the plaintiff's attorney.

One possible explanation of this finding emanates from the expectations jurors may have concerning trials in general. The only procedural difference that exists between the edited conditions and the no edit condition is the deletion of the objections and subsequent arguments between the two attorneys concerning the objections. It may be the case that jurors expect to hear the objections raised by attorneys and their arguments surrounding these objections. This information may be used by jurors to evaluate the expertise and competence of the attorneys, as suggested by Fontes (1975).

By deleting not only the objections raised but also the arguments germane to the objections, jurors may be denied information concerning the rhetorical skills of the contesting attorneys that affects their perceptions of the credibility of the attorneys. When an objection is raised by an attorney and sustained by the presiding judge, jurors are instructed to disregard the inadmissible testimony or evidence with the intent that this information should not be considered during the decision-making process that leads to a verdict. There exists no legal mandate to disregard the attorneys' behavior during the assessment of the admissibility or inadmissibility of testimony or evidence. Conceivably, a client's case could be seriously jeopardized by the incompetency of his or her attorney in spite of favorable trial testimony or evidence presented during the trial.

It may be that jurors are naive in some respects about the procedures followed during a trial and the law applicable in any given case. However, it would be equally naive to assume that jurors have no expectations concerning courtroom trials and attorney behavior given the large number of courtroom dramas appearing on television. Additionally, jurors possess common sense and intellect that facilitate not only assessment of the attorneys' legal strategy during the course of a trial, but also enable the jurors to formulate a legal strategy that they would have used if they were acting as a trial attorney. In one sense, this is similar to the hindsight of the "Monday morning quarterback" who delineates the shortcomings of a football coach's strategy during Sunday's game.

If jurors conclude that the attorney did an inadequate job of representing his/her client, they may disassociate the attorney from his/her client and base their verdict upon the information provided solely through testimony. If the jurors' perceptions of either attorney's credibility were not extremely favorable and if they disassociate their decision-making from the attorneys' performance, we would not expect to find a relationship between jurors' perceptions of attorney credibility nor with any other variables of import.

Granted, there are a number of important ifs in this explanation, and while we have no data that bear directly on this issue, those we do have support it. While there was no relationship between the jurors' perceptions of the credibility of the attorneys in this case and their verdicts, there were significant relationships between the testimony provided by the plaintiff, witness, and the defendant and the verdicts arrived at by jurors. Moreover, the editing techniques only affected the plaintiff's attorney's perceived credibility. He was seen as slightly more credible than the defendant's attorney.

Additional anecdotal evidence supports this explanation. During their debriefings, jurors were quite vocal in their appraisals of the attorneys' performance. Most of them were not impressed with the attorneys. They complained that both attorneys failed to ask questions of the individuals testifying that were very important to a fair assessment of the trial. The jurors also felt that there were other individuals associated with the case who should have testified during the trial; as a result, they felt the attorneys had presented an incomplete case. It is worth noting that many of the jurors compared this trial to courtroom drama appearing on television when evaluating the legal strategies used by the attorneys.

While the jurors were critical of both attorneys, they were more critical of the defendant's attorney. Although there was no statistically significant difference between the perceived credibility of the two attorneys, the plaintiff's attorney was rated slightly higher. Furthermore, only the perceived credibility of the plaintiff's attorney was affected by the editing techniques. This suggests that the plaintiff's attorney's rhetorical behavior regarding the inadmissible evidence made a more favorable impression on jurors than did the behavior of the defendant's attorney. Still, the between group differences for the defense attorney were not robust enough to yield significant differences.

A significant relationship was found between the editing techniques and the amount of distraction experienced by the jurors. The differences in the magnitude of distraction experienced by jurors in the various experimental conditions were not uniform nor were all of the differences statistically significant. The clean edit condition was not significantly different from the no edit condition, although the remaining editing conditions were significantly different from the no edit condtion. The blackout fast forward condition was not significantly different from the clean edit condition nor the blackout normal machine speed condition, but was significantly different from the remaining conditions. Finally, the blackout normal machine speed condition was not significantly different from the video only condition.

One factor that could explain this pattern of relationships is the amount of time necessary to execute the edits. The clean edit lasts for only a split-second, and the blackout fast forward edit lasts an average of 17.33 seconds; the blackout normal machine speed edit and the video only edit both last an average of 74.5 seconds.[16] Clearly, the distraction effect of an edit that lasts for a split-second comes closer to approximating the no edit condition than any other condition. The distraction effect of an edit which lasts approximately 17 seconds is not significantly different from the distraction effect of an edit that lasts for a split-second. Also, the distraction effect of an edit which lasts for approximately 17 seconds is not significantly different from the distraction effect of an edit that lasts for approximately 74.5 seconds. This last comparison, however, is not entirely accurate. As noted above, both the blackout normal machine speed edit and the video only edit last an average of 74.5 seconds. Yet, the blackout fast forward edit differs significantly from the video only edit and not the blackout normal machine speed edit. This may be due to the fact that the two blackout edits are identical except for the amount of time necessary to execute the edit. On the other hand, the video only edit is different from the blackout fast forward edit in the amount of information deleted as well as the amount of time necessary to execute the edit.

Perhaps differences in the amount of information deleted coupled with differences in time are necessary to produce a significant difference when the edits range from 17 seconds to 74 seconds. This possibility would account for the difference found between the blackout fast forward edit and the video only edit. In addition, it would explain the lack of significant differences between the blackout normal machine speed edit and the video only edit. These last two edits differ in the amount of information deleted, but do not differ in the amount of time necessary to execute the edit. In sum, it would appear that there exists some critical level of time difference, such that if two editing techniques exceed that limit, then that difference will be sufficient to produce significant differences in the amount of distraction. If the limit is not exceeded, then significant differences will not occur, unless there is a discrepancy in the amount of information deleted. Precisely what difference in time constitutes a critical level is not known.

The different editing techniques did not significantly affect the amount of trial-related information retained by the jurors. One possible explanation for the lack of significant differences concerns the reliability of the retention items. The items were pretested using college undergraduates. When administered to a sample of jurors, the reliability of the items dropped. Consequently, more items were dropped from the test to increase the reliability. The resultant reliability was .76, which is reasonably high. Still, the test may be capable of making gross discriminations between jurors, but not powerful enough to make precise discriminations.

The relationship between the editing techniques and the credibility of the defense attorney was not significant. Further, the editing techniques were not significantly related to the credibility ratings of the plaintiff, the defendant, or the security guard. An inspection of the means indicates one general trend: the credibility ratings for all trial participants are lower in the various editing conditions.

A plausible explanation for this trend is that the edits may distort the information in the trial. The exact nature of this distortion is not known. Another possible explanation is that jurors become curious and/or upset over the deleted information and try to guess what occurred during the edits. The reports from the confederates used in this study as well as the information elicited from the jurors during the debriefing support this interpretation. Thus, the jurors' speculation of what may have transpired during the edited portion could have an effect on the trial participants' credibility.

One variable found to be significantly related to the credibility of the trial participants is distraction. Significant negative relationships were observed between distraction and the plaintiff's credibility, the security guard's credibility, and both attorneys' credibility. The relationship between distraction and the defendant's credibility was negative, but not significant. Given past research on credibility and persuasion, as well as on distraction and persuasion, this finding is somewhat perplexing. Generally, distraction has been found to increase the persuasibility of a message.[17] Similarly, high credible sources are more persuasive than low credible sources. Thus, it would seem reasonable to assume that distraction and credibility would be positively related.

One possible explanation for observing a counter-intuitive relationship between distraction and credibility rests in the characteristics of the setting of this study and the sample employed. In most of the distraction research, the sample used consisted of college undergraduates. Furthermore, the subjects in these studies were usually presented a message from one source and changes in attitude toward the topic and/or the source were measured. However, the present study is quite different. The subjects used in this study were adults who were being asked to evaluate messages from more than one source and then reach a decision that would have important consequences for people other than themselves, i.e., the litigants of the trial. In short, the demands of a trial are very different than those of a classroom setting where subjects are asked to listen to one persuasive message. Possibly, the typical results for past research on distraction are not applicable to the present study, due to the differences just discussed. However, more research is needed to determine whether or not the findings from the distraction research are generalizable to situations similar to the one employed in this study.

No significant differences were found for verdict among the various conditions. However, the credibility ratings for the three witnesses were significantly correlated with verdict. The direction of the correlations is not surprising. The credibility of the plaintiff and the credibility of the security guard were positively related with a verdict in favor of the plaintiff. The credibility of the defendant was positively related with a verdict in favor of the defendant.

The findings from this study have definite implications for the legal community. First, the editing of inadmissible testimony appears to result in a decrease in perceived credibility of the trial participants. The problem is finding out why this effect occurs. If it occurs because editing of testimony violates the expectations of the jurors with regard to what is supposed to happen in a trial, then a solution would be to restructure the expectations of jurors. Still, research needs to be conducted to determine what expectations jurors have with regard to trial proceedings.

The second major implication concerns the amount of distraction associated with each editing technique. Given the negative relationship between distraction and credibility, it seems obvious that the best technique to use would be the one that has the least amount of distraction associated with it. Based on the results of this study, the clean edit technique would be advised. However, if the objections were short enough, another edit might suffice. This possibility awaits further research aimed at establishing time levels more precisely.

Based on the present findings, as well as the experience gained by the researchers while executing the various editing techniques, the following recommendations are offered. Of the four editing techniques examined, the best technique to use would be the clean edit. This is primarily due to the fact that the clean edit was not significantly more distracting then the no edit condition, while the other techniques were significantly more distracting. Still, the time and costs of executing the clean edit are substantially higher than the other three techniques. However, if the costs of performing the clean edit are prohibitive, then another technique could be used under certain conditions. If the material to be edited is less than 17 seconds, then the blackout normal machine speed technique would be satisfactory. The blackout fast forward technique is not recommended due to the difficulty involved in executing the edit. The operator must pay close attention to the trial, as well as the speed of the machine while advancing the tape. The probability of making an error is greatly increased. For example, the operator may advance the tape too far, or not far enough, which would increase the time necessary to execute the edit. This may increase the amount of distraction attributed to the edit, which in turn may affect the perceived credibility of the participants in the trial. The video only technique is not recommended under any circumstances. This edit was perceived as being the most distracting edit. Furthermore, it does not eliminate all of the information that transpires during the inadmissible testimony. For these reasons, the video only technique is considered to be inferior to the other three techniques.

In conclusion, the researchers consider the clean edit technique to be superior to the other editing techniques. Any replication and/or extension of this study should focus on several factors. In addition to adding support to the findings reported here, there exists the need to determine the critical time values that separate the effects of one editing technique from another. In addition, this study suggests the need to examine what specific factors a juror uses to assess the credibility of the trial participants.

MULTI-CAMERA VS. SINGLE-CAMERA STUDY

Major Study Question: What are the effects of using multi-camera vs. single-camera systems to videotape trial presentations?

Given the flexibility of the videotape medium, a multiplicity of systems can be used to videotape trial presentations. In our previous research, we evaluated the effects of using a multiple camera system to produce a split-screen presentation of a trial and compared it to a full-screen presentation of the same trial. Both of these systems were "fixed" to control for any differences that might have been introduced by production techniques such as panning and zooming.

The greatest difference between these two systems emanated from the amount of detail captured by the respective systems. The single-camera, full-screen system had the advantage of providing jurors with a realistic shot of the entire trial area and permitted the use of relatively inexpensive equipment. On the other hand, it did not permit jurors to pick up many subtle nuances in facial expression and gesture.

By contrast, the triple-camera, split-screen system allowed jurors to study the idiosyncratic responses of trial participants in greater detail. The two camera shots that comprised the upper half of the screen -- that is, the shot of the witness in the upper left quarter and the questioning attorney in the upper right quarter -- provided more detailed shots of the participants because the cameras were focused tightly on those portions of the trial area. The greatest potential limitation of the split-screen system was its lack of realism. Unlike the full-screen system, which communicated a single shot of a familiar setting, the split-screen system relied upon technology to create a more visible, yet more "unnatural" product.

We examined the effects of these two different systems on juror verdicts, attributions of negligence, perceptions of attorney credibility, information retention, and motivation and interest in the trial. Only one statistically significant difference was found between jurors who viewed the full-screen and split-screen presentations. The attorney for the plaintiffs in the trial was rated more credible by those jurors who viewed him on the split-screen system. While this finding was less than overwhelming, it did suggest the need for additional research focusing upon different types of video systems that could be utilized in the courtroom environment.

We were somewhat perplexed initially about the credibility finding. It had been assumed that the greater detail provided by the split-screen might result in more favorable perceptions of both attorneys. Although admittedly speculative, there is a possible explanation for the fact that this effect was more pronounced for the plaintiffs' attorney than for the defendant's attorney. Informal observation of the two attorneys indicated that the plaintiffs' attorney's greatest strength was his expressive nonverbal behavior and his skillful use of props such as his glasses. The defendant's attorney, on the other hand, relied more heavily on vocal delivery and persuasive voice inflection. Obviously, the plaintiffs' attorney's nonverbal talent could be observed more easily on the split-screen while the vocal abilities of the defense attorney would be readily recognized in either presentation. Hence, the credibility of some trial lawyers may be enhanced more by the split-screen system than by an inexpensive full-screen system.

There were other explanations considered for this finding. One of these explanations centered on the physical attractiveness of each of the attorneys. Numerous studies (e.g., Byrne, London & Reeves, 1968; Berscheid & Walster, 1969; Dion, Berscheid & Walster, 1972) have demonstrated that people respond differently to individuals who vary in physical attractiveness. In general, these response differences fall in line with favorable stereotypes of attractive persons, although some of them appear to be sex-specific. Conceivably, the attractiveness of the two attorneys exerted some influence upon the jurors' perceptions of their credibility. Given the greater detail provided by the split-screen system, the effects of the physical attractiveness variable should be more pronounced for jurors who viewed the split-screen presentation. Unfortunately, this reasoning is entirely speculative because we did not have any data that assessed jurors' perceptions of the physical attractiveness of the attorneys nor did we have any data concerning the effectiveness of their nonverbal communication.

Consequently, it was decided to replicate the study with some modifications and to take direct measures of both the jurors' assessments of the physical attractiveness of the plaintiff and defense attorneys as well as the effectiveness of their nonverbal behavior. In this study, we examined the effects of a multi-camera system as compared to a single-camera system on jurors' verdicts, perceptions of attorney credibility, assessments of the attorneys' nonverbal behavior, and assessments of the physical attractiveness of the two attorneys. The credibility measure employed in this study consisted of three dimensions: trustworthiness, expertise, and dynamism.

Procedures

The full-screen and split-screen videotaped versions of the trial concerning a defendant accused of conversion of bank funds were used in this study. A complete discussion of the trial itself was provided earlier during our discussion of the effects of inadmissible evidence upon jury deliberations.

Recall that two different video systems were used to tape this stimulus trial. One system consisted of a fixed color camera which produced a panoramic view of the courtroom proceedings that could be played back to jurors in black-and-white or color. The trial was simultaneously taped using a fixed four-camera monochromatic system. One camera was focused upon the witness stand, one on the plaintiff's attorney when he was seated, one on the defendant's attorney when he was seated, and one on the podium where either attorney would stand when questioning a witness. A special effects generator was integrated into this system to enable us to record a shot in which the interrogating attorney occupied one-half of the screen and the witness being questioned the remaining half. The shots produced of each of the trial participants were of the upper one-third of their bodies.

The trial contained six instances of inadmissible evidence. Each time the attorney who was seated and off-camera raised an objection, the camera focused upon him was activated remotely by the technician manning the special effects generator. This technique produced an image in which the objecting attorney appeared in one-half of the screen and the interrogating attorney in the other half, thus ensuring that jurors would be able to pick up many subtle nuances in facial expression and gesture of the trial witnesses and the interrogating attorney. The system had the additional advantage of ensuring that jurors could observe the nonverbal behavior of both attorneys when objections were raised.

A number of limitations associated with this type of system merit comment. The trial judge only appeared on camera at the beginning of the trial, to instruct the jury concerning the litigation that was before the court, and at the end of the trial, to instruct the jury concerning their deliberation and verdict. The panoramic view of the judge convening the trial and giving the jury instructions recorded on the color system was edited in black-and-white onto the tape produced by the monochromatic system. Consequently, the judge's opening statement and instructions were exactly the same for the jurors who viewed the full-screen version and those who viewed the split-screen version of the trial.

The split-screen version has a second limitation. It is an "unnatural" communication product produced through the use of technology. Only the individual testifying and the questioning attorney appear on the video monitor except when objections are raised and both attorneys are presented. The rest of the litigants remain off-camera except when they are testifying. As a result, jurors are unable to evaluate litigants' nonverbal reactions to evidence presented by other litigants.

A third limitation of the split-screen system is the cost. It is significantly more expensive than the full-screen system.

Experimental design. A simple two condition design was employed in this study. The first condition consisted of a full-screen presentation and the second condition was the split-screen presentation of the trial.

Role-playing jurors. Because of limitations in the availability of a courtroom setting and actual impaneled jurors, 72 undergraduate students at Michigan State University role-played jurors in this study. Participants were randomly assigned to one of the two experimental conditions. They were told that they would be viewing an actual videotaped trial and that their task was to role-play a conscientious juror. They were instructed to assume that their verdict would be binding upon the plaintiff and the defendant.

Measurement techniques. The scales used in this study were the same as those used in the editing techniques study with several modifications. First, there were no measures of distraction taken in this study. Second, measures of the students' perceptions of the physical attractiveness of the trial attorneys were taken utilizing semantic differential scales. Role-playing jurors were asked to complete the following scale for each trial participant.

> In comparison to people in general, Mr. Wells was:
>
> Very Physically Attractive ___:___:___:___:___:___:___ Very Physically Unattractive

The third difference concerned the use of nonverbal communication by the attorneys. Likert scales were employed to measure the students' assessments of the effectiveness of the nonverbal behavior of each attorney. Students were asked to complete the following scale for both attorneys:

> The plaintiff's (or defense) attorney's use of nonverbal communication was very effective.
>
> ______ strongly agree
> ______ agree
> ______ undecided
> ______ disagree
> ______ strongly disagree

Results

A chi-square was computed to determine if there were statistically significant differences in verdicts between role-playing jurors exposed to the full-screen presentation and those exposed to the split-screen version. There was no significant difference at the .05 level (Table 37), which was used for all statistical tests reported here.

TABLE 37

Verdicts in Split-Screen and Full-Screen Presentations

	Split-Screen	Full-Screen
Innocent	25	19
Guilty	11	17

$X^2 = 1.46$, $p > .05$

Perceptions of the physical attractiveness of both attorneys were measured. Differences in ratings of physical attractiveness between students in the split-screen and full-screen conditions were tested utilizing t-tests. The results of these tests, presented in Tables 38 and 39, produced no statistically significant differences.

TABLE 38

Perceptions of the Physical Attractiveness of the Plaintiff's Attorney

	Split-Screen	Full-Screen
$\overline{X}$	4.11	4.14
s.d.	.82	.49
N	36	36

$t < 1$, df = 70, $p > .05$ (two-tailed test)

TABLE 39

Perceptions of the Physical Attractiveness
of the Defense Attorney

	Split-Screen	Full-Screen
$\overline{X}$	4.39	4.19
s.d.	.90	.71
N	36	36

$t = 1.02$, $df = 70$, $p > .05$ (two-tailed test)

Role-playing jurors in both the full-screen and split-screen conditions were asked to assess the effectiveness of the nonverbal communication of both attorneys. There was no significant difference for the plaintiff's attorney (Table 40) but there was for the defendant's attorney. Specifically, role-playing jurors in the full-screen condition evaluated the defense attorney's nonverbal communication as more effective than did their counterparts in the split-screen condition (Table 41).

TABLE 40

Assessments of the Effectiveness of the Plaintiff
Attorney's Nonverbal Communication

	Split-Screen	Full-Screen
$\overline{X}$	3.17	3.39
s.d.	.91	.60
N	36	36

$t = 1.22$, $df = 70$, $p > .05$ (two-tailed test)

TABLE 41

Assessments of the Effectiveness of the Defense Attorney's Nonverbal Communication

	Split-Screen	Full-Screen
$\overline{X}$	2.97	3.53
s.d.	.77	.77
N	36	36

$t = 3.04$, $df = 70$, $p < .05$ (two-tailed test)

Assessments of the credibility of both attorneys were measured using a combination of semantic differential scales developed by Berlo, Lemert, and Mertz (1969-1970) and McCroskey (1966). This measurement scale, discussed fully in our report of the editing techniques study, consisted of the following three dimensions: (1) trustworthiness, (2) expertise, and (3) dynamism. Role-playing jurors' responses to the items germane to each of these dimensions were factor analyzed and items loading .55 and above on a given factor without a cross-loading on another factor greater than .31 were retained. None of the factor loadings for the expertise items satisfied this criterion, indicating that perceptions of the credibility of the trial attorneys were based primarily on the trustworthiness and dynamism dimensions. The factor loadings for the items relevant to these dimensions ranged from .57 to .91.

A series of t-tests was used to determine if the mode of presentation, split-screen vs. full-screen, systematically influenced perceptions of the trustworthiness and dynamism of either the defense attorney or the plaintiff's attorney. The results presented in Tables 42, 43, 44, and 45 indicated that the perceived credibility of the attorneys did not significantly differ as a function of the mode of presentation.

TABLE 42

Perceptions of the Trustworthiness of the Defense Attorney

	Split-Screen	Full-Screen
$\overline{X}$	25.03	25.61
s.d.	5.02	5.70
N	36	36

t < 1, df = 70, p > .05 (two-tailed test)

TABLE 43

Perceptions of the Dynamism of the Defense Attorney

	Split-Screen	Full-Screen
$\overline{X}$	25.92	27.53
s.d.	5.58	4.63
N	36	36

t = 1.33, df = 70, p > .05 (two-tailed test)

TABLE 44

Perceptions of the Trustworthiness
of the Plaintiff's Attorney

	Split-Screen	Full-Screen
$\bar{X}$	26.06	25.67
s.d.	4.55	4.95
N	36	36

$t < 1$, df = 70, $p > .05$ (two-tailed test)

TABLE 45

Perceptions of the Dynamism of
the Plaintiff's Attorney

	Split-Screen	Full-Screen
$\bar{X}$	25.67	26.53
s.d.	4.78	3.95
N	36	36

$t < 1$, df = 70, $p > .05$ (two-tailed test)

Discussion

The results reported here warrant two conclusions: first, exposure to the two modes of presentation does have some systematic effects upon jurors' perceptions of trial attorneys; second, exposure to either mode of presentation does not significantly influence the verdicts arrived at by jurors. Although perceptions of attorney credibility and physical attractiveness were not influenced by these alternative modes of presentation, assessments of the effectiveness of the defense attorney's nonverbal communication were affected. Specifically, role-playing jurors exposed to the full-screen trial presentation found the defense attorney's nonverbal communication to be more effective than did their counterparts who viewed the split-screen presentation. This may be attributable to the use of very expressive hand gestures used by the defense attorney to emphasize important issues during his questioning of witnesses and during his closing argument which were more discernible in the full-screen presentation.

Even though this difference materialized, it should be noted that verdicts were not significantly influenced by these two different modes of presentation. Consequently, there appears to be no substantial evidence that would suggest the superiority of one video system over the other. Simply stated, the use of either recording system produces essentially the same results.

CAMERA SHOT STUDY

Major Study Question: How do camera shot and witness strength affect jurors' responses to a videotaped deposition?

The advent of videotape in the legal system has aroused many concerns for jurists. One concern deals with the technical aspects of the use of videotape (Bermant, McGuire & Chappell, 1975). From a technical standpoint, the concern encompasses the quality of the equipment, the skills of the technicians, the production techniques applied, and the editing of the videotape (see Doret, 1974).

Currently, there are few rules governing taping and presentation of testimony. For example, Ohio's Superintendence Rule 15 stipulates that standard one-half inch videotape equipment constitutes the standard for filming and playback of testimony and other evidence. However, the ruling allows for deviations from the standard as long as compatible equipment is supplied or the original tape is converted such that it is compatible with the standard. The only other requirement is that there must be a minimum of one monitor having at least a 14 inch screen, for playback to the jury.

Clearly, Ohio's Superintendence Rule 15 allows the litigants a good deal of freedom in deciding how and where to videotape. The ruling supplies no limitations on lighting, panning, zooming, camera angles, special effects, backdrops, etc. The lack of specificity concerning the use of videotape in the legal setting has prompted researchers to express concern that the "techniques of film and television art will soon become applied to videotaped depositions and testimony" (Bermant, _et al._, 1975, 8). Conceivably, the use of various production techniques could systematically affect the information that is presented in a trial. Thus, it is important to understand how these techniques affect jurors' perceptions of trial participants as well as the information provided by them.

Unfortunately, very little research has examined the effects of production techniques on viewers. Perhaps film has been considered an artistic medium lending itself to evaluation by aesthetic criteria. While aesthetic criteria may be acceptable for evaluating many types of films (e.g., dramas, comedy, suspense) it is inadequate for evaluating the effects the techniques may have on jurors. Thus, research is needed to determine what systematic effects, if any, various production techniques have on jurors' responses to videotaped testimony.

A basic question raised by many leading jurists concerns the type of camera shot that should be employed when videotaping a witness. Doret (1974) has addressed most of the central issues involved in this question. Many alternatives are available when taping a witness and the use of any particular camera shot has advantages and disadvantages. For example, Doret (1974) states that a shot providing a panoramic view of the courtroom offers the jury:

> ...a viewing experience similar to that of watching a movie of a stage play. The advantage of this method is that it deviates least, in terms of the visual field offered the juror, from the traditional trial, and offers the juror the widest possible universe of sensory data to formulate his impressions upon. The disadvantage of this method is the inability of the panorama to capture in detail the nuances of the demeanor of the witness (233-234).

The problem of the lack of visual detail associated with the panoramic shot could be alleviated by using a close-up (head and shoulders) or medium (head and torso) shot of the testifying witness. However these shots also have disadvantages. First, the amount of sensory data available to the juror would be greatly reduced. Whether this reduction has any systematic effect on the jurors' decision-making process is unknown. Additional disadvantages are dependent upon how the shot is executed in the context of the entire trial. If the camera is positioned for a close-up or medium shot and remains stationary, then jurors may detach the witness from the courtroom environment, or whatever setting in which the taping occurred. Further, the jurors would not be able to see the behavior of off-camera participants. The other trial participants' reactions to a witness' testimony may constitute important information to the jurors.

Currently, three types of camera shots are predominately used in the legal system when videotaping witness testimony:

(1)	close-up shot:	tight focus on the head and shoulders of the witness
(2)	medium shot:	focus from the head to just above the waist of the witness
(3)	long shot:	full focus of the witness from head to foot

In addition, a fourth shot (a very long shot) is often used at the beginning of a taping session to allow the jurors to see all the participants. It is not presently known what effect these camera shots have on jurors' responses to a videotaped witness. Thus, the purpose of the present study was to determine whether the three different camera shots (i.e., close-up, medium, long) used to videotape witness testimony have any systematic effect upon jurors' impressions of a witness.

A logical beginning for determining the effects of camera shots on jurors' responses would entail an examination of television production texts. Most television and film production texts include a discussion of camera techniques, but many of them are limited to a "how to" discussion. These texts discuss camera techniques from a technical perspective describing different lenses, cameras, dollies, etc. (Fulton, 1960; Quick & LaBau, 1972; Scott, 1975). At best, these texts include descriptions of how images change as a function of camera distance, lens selection, f-stops, etc., but offer nothing in the way of how these techniques affect the reactions of viewers.

In contrast, other texts go beyond the basic "how to" discussion, and provide discussions of how viewers may react to various camera techniques (Eisenstein, 1960; Bretz, 1962; Millerson, 1964; Zettl, 1966; Lewis, 1968; Davis, 1960; Madsen, 1973). While the effects of many different camera techniques are discussed in these texts, only camera shots are of central concern.

According to television production texts, the long, medium, and close-up shots have distinct functions. Millerson (1964) summarizes the utility of each of these shots.

The long shot serves to personalize the individual(s) being filmed. In contrast to longer shots (e.g., the very long shot), movement becomes more recognizable. Moreover, facial expressions and gestures become more dominant. Thus, in the long shot, emphasis is placed more on the actor(s) rather than the setting.

The medium shot serves to direct the attention to one or two individuals and provide ample cues. Facial expressions and gestures become more prominent in the medium than in the long shot.

The purpose of the close-up shot is to concentrate the viewer's interest. It forces the viewer to notice detail that might otherwise be overlooked. The close-up shot is usually used for dramatic emphasis of detail (Madsen, 1973).

In sum, the three camera shots differ with respect to the number of sensory cues made available to the viewer as well as the saliency of the cues presented. Of the three shots considered, the close-up provides the fewest sensory cues and the greatest saliency of the cues presented. In contrast, the long shot provides the greatest number of sensory cues and the lowest saliency of the cues presented. The medium shot falls between the close-up and long shots; i.e., it provides more sensory cues than the close-up shot, but fewer than the long shot. The saliency of the cues presented by the medium shot is less than the close-up, but greater than the long shot. Considering the videotaped witness, these effects can significantly alter jurors' perceptions of that witness.

The literature on person perception adds credence to this last point (e.g., Bruner & Taguri, 1954; Bruner, 1957; Hastorf, Schneider & Polefka, 1970; Shaver, 1975, 1977). Early research in person perception has shown that subjects alter their impressions of a hypothetical stimulus person by simply rearranging a list of descriptive adjectives (Asch, 1946; Luchins, 1957; Anderson & Hubert, 1963). Additionally, researchers contend that some traits are more central than others, and that their inclusion in a list of adjectives can significantly alter subjects' impressions of both a hypothetical stimulus person (Asch, 1946) and a live stimulus person (Kelley, 1950). Thus, when people are privy to information about persons prior to meeting them, the order and type of adjectives used in describing the persons can affect initial impressions.

This is directly analogous to what transpires in most trials, particularly for the defendant. Usually, jurors receive information about the defendant before s/he takes the stand. The order and type of information presented will probably influence the jurors' initial impressions. Therefore, jurors will form an impression of the defendant prior to viewing his/her behavior during testimony, and may look for behaviors that support their initial impression. This is called the prior entry effect (Jones & Gerard, 1967). The presentation of the defendant to the jurors is significant. Conceivably, the defendant could be presented such that the behaviors shown may confirm or contradict the jurors' initial perception. Therefore, an understanding of how people form impressions from a person's behavior is important.

Bruner (1957) contends that impression formation is an act of categorization of attributes of a stimulus person. That is, people learn through experience of what elements of the stimulus person are related and these are combined into meaningful categories. Some attributes (stimulus elements) are more relevant than others. Bruner calls these critical attitudes, which serve to define the boundaries of the category.

As one might expect, when perceivers define categories of behavior, they begin to respond to the stimulus person in terms of those categories. Thus, the stimulus person becomes a role occupant in a category rather than a unique individual. This increases the likelihood that the perceiver will make errors in judgments (Bruner, 1957; Goffman, 1963; Miller & Steinberg, 1975).

Although perceptual accuracy has concerned many researchers in the area of person perception (see Cline, 1964), it is not a major concern here. Rarely, if ever, will jurors know if their perceptions are accurate. More important is the fact that they think they are accurate, and respond according to their perceptions. Thus, it is important to understand how the different camera shots may alter jurors' perceptions of the witness.

Earlier it was argued that camera shots differ both in the number of sensory cues presented to the viewer and the saliency of those cues. The reduction of sensory cues may reduce the number of criterial attributes available to the jurors, which could result in a different categorization of the witness.

Differences in the saliency of the cues presented may also affect jurors' perceptions of the witness. These differences may alter the saliency of certain attributes. For example, the close-up and medium shots may cause jurors to concentrate on attributes of the witness that would have been overlooked, or perceived as less relevant if a long shot had been used. The alteration of relevant attributes could also lead to different impressions of the witness.

Recently, some researchers have undertaken the task of testing the effects of different camera shots on viewers' responses. An examination of the relevant research concerning these effects follows.

Relevant Research

Williams (1965) examined the effect of varying camera shots on viewers' expressed interest level toward a televised lecture. His results indicated that expressed interest level did not significantly differ as a result of using a variety of close-up and long shots compared to utilizing a static medium shot. However, when examining shot differences using a film screen, Williams (1968) found that viewers' expressed interest level significantly decreased when a long shot was employed.

Wurtzel and Dominick (1971-72) examined the effects of acting style and camera shot on viewers' evaluations of television drama. An 11 minute emotional scene was performed by three professional actors utilizing two different acting styles: film acting and stage acting. Stage acting differs from film acting in that gestures and expressions are more elaborate and pronounced when an actor is performing on a stage. The scene was filmed four times in order to obtain the levels of the two independent variables of acting style (film acting and stage acting) and type of shot (close-up and medium).

The dependent variable was an evaluation measure comprised of ten bipolar adjectives. Six of these scales were derived from an evaluative measure developed by Osgood, Suci, and Tannenbaum (1957). The other four scales consisted of "adjectives most used in instructor evaluations of the media performance class at Queens College," which correlated highly with the other six scales.

The main effects for acting style and camera shot were not significant, but a significant interaction was observed. Specifically, viewers evaluated the scene more favorably when the actors were film acting and a close-up shot was used as opposed to a medium shot. Viewers in the medium shot condition evaluated the scene more favorably than did viewers in the close-up shot condition when stage acting was employed.

McCain and Repensky (1972) examined the effect of camera shot on interpersonal attraction. Two comedians, Edmonds and Curly, performed two routines. These routines were taped using three camera shots simultaneously: close-up shot, medium shot, and long shot. The measure of interpersonal attraction was comprised of three dimensions: physical attraction, social attraction, and task attraction. The authors derived these three dimensions using orthogonal factor analysis and thus treated each dimension independently in the analyses.

Results indicated that camera shot does affect interpersonal attraction, but the effects differed for each performer. Analysis of the physical attractiveness data yielded a significant main effect for comedian and a significant interaction of comedian and camera shot. Edmonds was perceived as being more physically attractive than Curly in the close-up shot than in the medium or long shot, while Curly was perceived as being more physically attractive than Edmonds in the medium and long shots. Neither comedian was perceived significantly more attractive in the close-up shot. No significant differences were obtained for social attractiveness, but a significant interaction was observed for task attractiveness. Curly was perceived as most task attractive in the close-up condition while Edmonds was perceived as least task attractive in the close-up condition. The two comedians did not differ in task attractiveness in any other condition.

Clearly, some characteristic(s) of the two comedians interacted with camera shot, but it is difficult to determine just what they were. The authors offer a number of plausible explanations which include the roles of the comedians (i.e., straight-man vs. funny-man), their physical appearance, and the quality of their performances.

In an attempt to uncover the influence of two particular source characteristics, McCain and Divers (1973) examined the effects of body type, sex of the source, and camera shot on interpersonal attraction and source credibility. Three males and three females were selected as stimulus persons and were classified into three categories of body type (Sheldon, 1954): endomorph (fat or plump); mesomorph (muscular or athletic); and ectomorph (thin or skinny). A close-up shot, a medium shot, and a long shot were employed. Interpersonal attraction was comprised of three independent dimensions: physical attraction, social attraction, and task attraction; while source credibility was comprised of five independent dimensions: competence, sociability, dynamism, composure, and character.

The six stimulus persons delivered a "three minute neutral speech," which was taped utilizing three cameras simultaneously in order to obtain the three levels of camera shot.

Results yielded significant main effects for body type and sex of the source. No main effect for camera shot was found, but a number of significant interactions were obtained. Once again, the interpretation of these results is clouded by the lack of control in the study. For example, the results suggested that the sex of the speaker had a strong impact on the results of the study. This result was interpreted cautiously by the authors, for as they noted:

> Since only one person of each sex represented each body type, the differences are really personal attribute differences of single individuals. Facial expression, fluency of presentation and other nonverbal variations between the males and females may well provide better explanations for differences between them than their gender differences (McCain & Divers, 1973, 9-10).

Thus while it would appear that body type, sex of the source, and camera shot influence interpersonal attraction and source credibility, this result must be interpreted cautiously given the lack of control of potentially relevant source characteristics.

Summarizing the research discussed thus far, different camera shots appear to have an impact on viewers' perceptions of a source's attractiveness and credibility. Unfortunately, the precise nature of these effects is still unknown. In virtually all of the studies discussed earlier, relevant source characteristics were not controlled. It is not known what effect these source characteristics may have had in the results reported in these studies.

One additional point is worth mentioning. In the studies reported earlier, the role of the sources differed; sources served as comedians (McCain & Repensky, 1972), lecturers (Williams, 1965, 1968), actors (Wurtzel & Dominick, 1971-72), and neutral speakers (McCain & Divers, 1973). As the role of the source changes, the role of the receiver and the purpose of the message changes. Conceivably, as the relationship between the source and the viewer changes, different cues emitted by the source become salient for the viewer. For example, viewers may attend to different cues if they know they are being entertained, than if they know they are being informed or persuaded. This point is particularly relevant when considering the role of jurors. Presumably, jurors are aware they will receive conflicting testimony. The jurors' task is to weigh the evidence presented, assess the veracity of the information, the credibility of the witnesses, etc. In essence, the juror acts as a judge of various witnesses' character and testimony.

Clearly, the role relationship between juror and witness is very different than the role relationship between comedian and viewer. Cues that are salient in one situation may not be as salient in the other. Consequently, results of the studies reported earlier may not be applicable to the legal setting, supporting the need for research on the effects of different camera shots on jurors' perceptions of a witness.

Recently, a study was conducted which examined the effects of different camera shots on jurors' perceptions of a witness (Halbert, 1978). Three independent variables were manipulated: (1) camera shot (close-up, medium, long, extreme long), (2) attractiveness of the witness (attractive, unattractive), and (3) sex of the witness. The dependent variables measured included identification with the witness, information retention, perceived credibility, interpersonal attraction, and viewer interest.

Four sources were used in Halbert's study: an attractive male and female and an unattractive male and female. The attractiveness levels of the sources were determined by a pretest. The sources presented the testimony twice to obtain the four levels of camera shot.

The results of Halbert's study yielded a number of significant three way interactions. Because of some problems with the manipulations, the results are somewhat suspect. Therefore, the findings will not be discussed; instead, attention will be devoted to the areas of concern surrounding the study.

One problem concerns the attractiveness manipulation. The mean attractiveness ratings indicated that while the two females differed significantly, the two males were not perceived significantly different in attractiveness. The weakness of the attractiveness manipulation for the male sources creates obvious problems in interpreting any of the results involving this variable.

The procedures used when taping the stimulus persons may also have influenced the results. Originally, five camera shots were used. The fifth shot, a very long shot, was dropped from the design. As mentioned earlier, due to a shortage of cameras, the witnesses presented the testimony twice to achieve the needed variations of camera shot. Unfortunately, no consistent pattern of shots was used when taping the witnesses. Thus, in the final design, different shots were from different presentations, which varied across witnesses. For example, for the attractive female, the close-up, medium, and long shots were taken during one presentation, while the extreme long shot was taken during another. For the attractive male, the close-up and long shot were from one presentation, while the medium and extreme long shot were from another. Therefore, some differences may be partially attributable to differences in presentation rather than differences in camera shot.

The final area of concern surrounds the lack of control of potentially relevant source characteristics. The study employed only one individual of each sex for the levels of attractiveness. Thus, the differences obtained may be attributable to individual differences among the sources. Coupling this problem with the previous problem, it becomes clear that the results may have been affected by differences in presentations within sources as well as between sources.

Clearly, most of the research on camera shots conducted to date has lacked control for potentially relevant source characteristics. One study that largely avoided this problem was discussed earlier (Wurtzel & Dominick, 1971-72). Recall that the findings from this study indicated that acting style interacts with camera shot. Assuming that acting style is analogous to the presentational style of a source, then presentational style may serve as a useful construct to investigate in relation to camera shot. Still, given the many idiosyncratic behaviors of communication sources, the problem becomes one of determining a useful categorization of presentational style, particularly for the trial participant.

Confronted with a similar dilemma, Miller and Siebert (1975) offered a useful, albeit rough, distinction of two different types of witnesses: (1) strong witness, and (2) weak witness.[18] A strong witness was conceived to be "... assertive, attentive, and unhesitant," while a weak witness was seen as "... uncertain, fumbling, and inattentive" (18).

The earlier study investigated the effects of type of witness (strong and weak) and mode of presentation (color and monochromatic) on jurors' responses. Utilizing an actual trial deposition of an industrial accident, a professional actor was taped in color using a medium shot. The shot included the witness and two attorneys seated at a small table. The testimony was presented twice in order to obtain the levels of witness type. The tapes were then shown to role-playing jurors. The dependent measures included witness credibility, witness authoritativeness, witness character, and juror information retention.

The findings indicated that the strong witness was perceived significantly more credible and authoritative than the weak witness, but not of significantly higher character. Witness type had no significant effect upon jurors' retention of trial-related information.

The present study replicated and extended the study reported by Miller and Siebert (1975) with several important differences. The earlier study employed a static medium shot which encompassed the witness. The present study used three different camera shots (close-up, medium, and long) which encompassed only the witness.[19] In addition, the information retention measure was refined and a measure of composure was added.

Hypotheses

This section delineates the specific hypotheses of this study and the rationale behind their derivation. To achieve clarity, the main effects for witness type will be discussed first. The hypotheses will then be modified to take into account the effects of the different camera shots.

The first variable to be considered is the perceived composure of the witness. Composure is used here as a measure of the general presentational style of the witness. The specific items that comprise this measure are derived from the research on verbal and nonverbal behavior. For example, one characteristic of the strong witness is a fluent speech pattern, while the speech pattern of the weak witness is nonfluent. Research on speech fluency indicates that a nonfluent speech pattern is indicative of high anxiety, i.e., low composure (Dibner, 1956; Krause & Pilisuk, 1961; Pope & Siegman, 1962; Zimbardo, Mahl & Barnard, 1963; Kasl & Mahl, 1965; Cook, 1969). Therefore, one of the items of the composure measure is a measure of perceived anxiety of the witness. In essence, the composure measure serves as a check on the manipulation of witness presentational style. Thus, the following hypothesis is posited:

H_1 : A strong witness will be perceived as more composed than a weak witness.

The next variable is the perceived credibility of the witness. Jurors must often make decisions in the face of conflicting testimony. While many factors may impinge upon their decisions, most jurists would agree that the credibility of the witness has a large impact on the jurors' decision-making process.

Credibility[20] has been defined as a receiver's attitude toward a source at a given point in time (Auer, 1969; McCroskey, 1972). In addition, credibility has been conceived as a multidimensional construct (Lemert, 1963; McCroskey, 1966, 1972; Auer, 1969; Berlo, Lemert & Mertz, 1969-70). Still, researchers disagree on the number of relevant dimensions as well as the labels for those dimensions (McCroskey, 1966).

Berlo, Lemert, and Mertz (1969-70) report three dimensions that comprise credibility: safety, qualification, and dynamism. The first two dimensions comport with dimensions found by other researchers; however, questions concerning the validity of dynamism as a separate dimension of credibility have been raised. McCroskey (1972) reports a series of studies that found a dynamic source to be ". . . consistently more competent, and usually more trustworthy, than a passive source" (p. 66). Moreover, McCroskey (1972) reports that dynamism scale items were often represented on the competence factor.

Although the controversy concerning whether or not dynamism is a separate dimension of credibility continues, it is not of central concern here. Rather, it is important to note the importance of dynamism to the perceived credibility of the source.

The writings of Aristotle stressed the need for good delivery in acquiring credibility (Cooper, 1932). More recently, researchers have investigated the effects of delivery on credibility (Winthrop, 1956; Miller & Hewgill, 1964; Sereno & Hawkins, 1967; McCroskey & Mehrley, 1969; McCroskey, 1972).

Using the credibility scales developed by Berlo and Lemert (1961), Miller and Hewgill (1964) and Sereno and Hawkins (1967) found that fluent sources were perceived significantly more dynamic and competent than nonfluent sources. Moreover, Miller and Hewgill (1964) found that a fluent speaker was rated significantly more trustworthy than a nonfluent speaker, but this result did not emerge as clearly as the results for the factors of competence and dynamism. Sereno and Hawkins (1967) report findings in the same direction for the ratings of the source's trustworthiness, but the differences were not significant.

McCroskey and Mehrley (1969) employed the scales of authority and character which were developed by McCroskey (1966). These two scales are considered to be related to the dimensions of competence and trustworthiness. In addition, Berlo and Lemert's (1961) dynamism scale was employed. The authors report that a fluent source was rated significantly higher on all three dimensions than a nonfluent source.

Given the two types of witness presentational style employed in this study, the relationship between witness type and credibility can now be hypothesized. The strong witness, whose presentational style is characterized as fluent, assertive, and attentive (good delivery) should be perceived as more credible than the weak witness, whose presentational style is characterized as uncertain, hesitant, fumbling, and inattentive (poor delivery). Given the conceptualization of credibility offered by Berlo, Lemert, and Mertz (1969-70), the following three hypotheses were generated to test the effects of witness type on credibility:

H_2 : A strong witness will be perceived safer (more trustworthy) than a weak witness.

H_3 : A strong witness will be perceived more qualified than a weak witness.

H_4 : A strong witness will be perceived more dynamic than a weak witness.

The variables of witness authority and character will be considered conjointly. As noted above, the measures for these two variables were developed by McCroskey (1966) and are considered to be related to dimensions of credibility derived by other researchers. Given this relationship, one would expect the presentational style of a source to have the same effect upon these two variables as it does upon credibility. Some support is offered for this possibility by the results of the study by McCroskey and Mehrley (1969). Recall that they found that a fluent source was perceived more authoritative and of higher character than a nonfluent source. This finding leads to the following two hypotheses:

H_5 : A strong witness will be perceived more authoritative than a weak witness.

H_6 : A strong witness will be perceived as having higher character than a weak witness.

The next variable to be discussed in relation to witness type is information retention. When describing the behaviors of the strong and weak witness, it was stated that the weak witness would be nonfluent, fumbling, and inattentive. The nonfluency in speech may be disruptive to the extent that jurors find it difficult to follow the testimony. Moreover, the nonverbal behaviors of the weak witness may be distracting to the jurors, causing them to attend more closely to these behaviors than to the information presented verbally.

Research on distraction and message recall has produced inconsistent results. Some researchers have reported that distraction decreases recall of message content (Vohs, 1964; Gardner, 1966; Haaland & Vankatesan, 1968), while others have found that distraction increases recall (Silverman & Regula, 1968).

One explanation for these inconsistent findings is offered by Baron, Baron, and Miller (1973). They contend that the effects of distraction on message recall depend upon whether or not the distraction can be ignored. If the distraction is mild, an attempt will be made to block the distracting stimulus by attending more closely to the message. If the distraction is severe, than more attention will be paid to the distracting stimulus.

Assuming the distracting behaviors of the weak witness are disruptive, the following hypothesis is advanced:

> H_7 : Jurors exposed to a weak witness will retain less trial-related information than jurors exposed to a strong witness.

The presentational style of the witness is expected to have an effect upon jurors' expressed interest in the proceedings. Since the writings of Aristotle (Cooper, 1932), the importance of a source's presentational style and its effect upon receiver interest have been discussed by students of public speaking. While many factors ultimately affect receivers' interest, one general relationship is clear: the better the delivery of the source, the greater the likelihood of evoking receiver interest.

Earlier it was argued that the strong witness' presentational style characterizes good delivery, while the weak witness' presentational style characterizes poor delivery. Given the general relationship between presentational style and interest, the following hypothesis is posited:

> H_8 : Jurors exposed to a strong witness will express greater interest in the proceedings than jurors exposed to a weak witness.

Thus far, the hypotheses have focused on the relationship between witness type and the dependent variables without regard for the effects of camera shot. Those effects will now be discussed and the hypotheses will be modified to take them into account.

In order to discuss the effects of camera shot, it is necessary to recall the differences between the three shots. Earlier, it was argued that the shots differ in the number of sensory cues made available to the viewer as well as the salience of the cues presented. Specifically, the number of sensory cues is greatest in the long shot and least in the close-up shot, with the medium shot falling between the two. Moreover the cues are most salient in the close-up shot, less salient in the medium, and least salient in the long shot. Given the differences in the saliency of the cues presented, one would expect the characteristics of the witness to become most prominent in the close-up shot and least prominent in the long shot. Therefore, the effects of witness type upon the dependent variables in Hypotheses 1-8 are expected to change with respect to camera shot; specifically, the effects should be most pronounced in the close-up shot and least pronounced in the long shot. The effects in the medium shot should be less pronounced than in the close-up, but more pronounced than in the long shot.

The following 16 hypotheses have been posited to test the effects of camera shot upon the variables of composure, safety, qualification, dynamism, authority, character, information retention, and interest. The first eight are derived for the strong witness; the last eight for the weak witness. The effect upon the dependent variable discussed in each hypothesis is expected to be more pronounced in the shot that precedes the greater than (>) sign.

For the strong witness:

H_9 : composure: close-up shot > medium shot > long shot
H_{10}: safety: close-up shot > medium shot > long shot
H_{11}: qualification: close-up shot > medium shot > long shot
H_{12}: dynamism: close-up shot > medium shot > long shot
H_{13}: authority: close-up shot > medium shot > long shot
H_{14}: character: close-up shot > medium shot > long shot
H_{15}: information retention close-up shot > medium shot > long shot
H_{16}: interest: close-up shot > medium shot > long shot

For the weak witness:

H_{17}: composure: long shot > medium shot > close-up shot
H_{18}: safety: long shot > medium shot > close-up shot
H_{19}: qualification: long shot > medium shot > close-up shot
H_{20}: dynamism long shot > medium shot > close-up shot
H_{21}: authority: long shot > medium shot > close-up shot
H_{22}: character: long shot > medium shot > close-up shot
H_{23}: information retention: long shot > medium shot > close-up shot
H_{24}: interest: long shot > medium shot > close-up shot

It should be noted that the hypotheses for the effects of camera shot for the strong witness are reversed for the weak witness. Therefore, the last sixteen hypotheses combined produce a general interaction hypothesis:

> H_{25}: Jurors' perceptions of a strong witness will be more favorable in the closer shots, while jurors' perceptions of a weak witness will be more favorable in the longer shots.

Procedures

With the aid of legal experts a transcript of an actual deposition was selected. The deposition was of a defendant who was accused of negligence resulting in an industrial accident. The deposition, approximately 30 minutes in length, consisted of cross-examination by the plaintiff's attorney. It did not contain direct examination by the defendant's attorney.

Professional actors played the roles of the witness and the defense attorney. An actual attorney played the role of the plaintiff's attorney.

The type of witness manipulation consisted of the same actor playing two different roles: a strong witness and a weak witness. The presentational style of the strong witness was characterized as fluent, assertive, and attentive. The presentational style of the weak witness was characterized as uncertain, hesitant, fumbling, and inattentive.

The actor was trained to emit verbal and nonverbal cues that would engender impressions of the presentational styles of interest. For example, for the strong witness, the actor was instructed to speak normally, fluently, and with confidence; to hold his head erect; to maintain eye contact with the questioning attorney, and to lean slightly toward him. In addition, he was instructed to relax and not to fidget, tap his feet, or place his arms akimbo. For the weak witness, the actor was instructed to speak softly and nonfluently, insert pauses, "um's" and "uh's" in his sentences, maintain low eye contact with the questioning attorney, and lean slightly away from him. In addition, he was instructed to tense his muscles slightly, sigh occasionally, fidget, and tap his fingers and feet. These behaviors have been found to be indicative of the presentational styles of interest (Dibner, 1956; Kraus & Pilisuk, 1961; Reece & Whitman, 1962; Pope & Seigman, 1962; Zimbardo, Mahl & Barnard, 1963; Kasl & Mahl, 1965; Dittman & Llewellyn, 1968; Cook, 1969; Mehrabian, 1969, 1971; Harrison, 1974).

Taping the witness. The deposition was videotaped in a television studio at Michigan State University. The participants were seated at a rectangular table in front of a plain backdrop. The witness was seated at the middle of the table, with the attorneys at the ends. The deposition was videotaped in color utilizing three cameras simultaneously to achieve the three levels of camera shot. Each shot contained only the witness. Neither attorney appeared in the shot. A fourth camera shot (a very long shot), containing the witness and both attorneys, was used to offer the viewer a sense of location. This very long shot was edited onto the beginning and end of the videotape.

The angle used for all camera shots was 90° to the vertical plane. This angle was selected because past research has indicated that deviations from this angle have biasing effects on viewers (Tiemens, 1970; McCain & Wakshlag, 1974; McCain, Chilberg & Wakshlag, 1977). The deposition was videotaped twice, once for each witness type. The testimony was identical in both presentations. Only the delivery style differed.

Trial synopsis. In order to place the deposition in context, a brief trial summary was written with the assistance of legal experts. In addition, an injury for the plaintiff was contrived, as the deposition did not mention the specific injury. It was decided not to make the injury either too serious or too trivial, since this might influence jurors' impressions of the incident, which could have carried over and altered their impressions of the witness. Therefore, a moderately serious injury was considered to be most desirable.

To determine what a moderately serious injury would be, a list of 25 injuries which the plaintiff could have sustained was presented to 98 undergraduate students enrolled in communication courses at Michigan State University. They were asked to rate each injury on a seven-point scale, ranging from "not serious" to "very serious."

While the results indicated that a number of injuries were perceived as moderately serious, only one (a broken leg with no additional complications) was perceived as moderately serious and was minimally skewed in either direction of the scale. Therefore, the injury ascribed to the plaintiff was broken leg with no additional complications.

Role-playing jurors. The role-playing jurors used in this study were 197 undergraduate students enrolled in communication courses at Michigan State University. The study was conducted on three separate evenings in one week, two conditions each evening. The conditions were randomly assigned to each of the three evenings. Students volunteered to participate during one of the evenings. Upon arriving, they were randomly divided into two groups, one group for each condition.

The students were told they were participating in a study on jury size and that they would be assigned to a jury after hearing the testimony. They were given the trial synopsis, which was read aloud by the experimenter, and they then viewed the videotaped deposition. At the conclusion of the deposition, the students completed the questionnaire, were informed they would not be deliberating, and were debriefed.

Thirty-five students were randomly deleted in order to obtain an equal number of role-playing jurors for each condition. Thus, the total number used in this study was 162 (27 students for each condition).

Measurement techniques. This study was designed to determine the effects of camera shot and type of witness upon jurors' perceptions of the witness' composure, credibility, authority, and character; the amount of information retained by jurors; and the amount of interest expressed by jurors.

Jurors' perceptions of the witness' composure were measured with 10 seven-point Likert-type scales. The adjectives used were: friendly-unfriendly, confident-unconfident, relaxed-tense, attentive-inattentive, assertive-nonassertive, poised-nervous, calm-anxious, comfortable-uncomfortable, unhesitant-hesitant, and outgoing-reserved.

The 10 items were factor analyzed which yielded a single factor solution. One item (friendly-unfriendly) failed to load adequately and was deleted from the scale. The remaining nine items yielded an alpha coefficient of .90.

Witness credibility was measured using the scales developed by Berlo, Lemert, and Mertz (1969-70). The measure consisted of 15 seven-point Likert-type scales, which theoretically comprise three dimensions of credibility: safety, qualification, and dynamism. The jurors were presented all 15 scales and were asked to place a check in the space beside the answer which best described their opinion of the witness. For example:

________ very qualified

________ qualified

________ somewhat qualified

________ somewhat unqualified

________ unqualified

________ very unqualified

The 15 scales were factor analyzed using the multiple-group method (Nunnally, 1967). The results of this analysis indicated that the credibility measure was comprised of the three dimensions of safety, qualification, and dynamism. The alpha coefficients for these dimensions were .72, .72, and .85, respectively.

Jurors' perceptions of the witness' authority and character were measured utilizing scales developed by McCroskey (1966). Twenty-two items were designed to measure character. The measure consisted of statements about the witness to which the subjects rated their amount of agreement with the statement. For example:

I have confidence in this witness:

________ Strongly Agree

________ Agree

________ Undecided

________ Disagree

________ Strongly Disagree

The 42 items were factor analyzed to a two factor solution using varimax rotation with communalities in the diagonal. The results indicated that a number of items failed to load adequately, given a criterion of loading no less than .50 on one factor and no more than .20 on the other. After eliminating those items which failed to meet this criterion, the authority scale was comprised of seven items and the character scale 10 items. The resulting alpha coefficients for the authority and character scales were .85 and .90, respectively.

The amount of information retained by jurors was measured in the following manner. Sixty-four multiple choice questions were constructed concerning the testimony. The items were pretested using a sample of undergraduate students enrolled in communication courses at Michigan State University (N=58). The respondents were divided into two equal groups. One group was shown the medium shot of the strong witness, while the other was shown the medium shot of the weak witness. After viewing the videotape, they completed a questionnaire which included the 64 information retention items. The items were dichotomously coded as right or wrong. They were then subjected to an item analysis and those items that demonstrated low reliabilities were eliminated. Forty-six items, yielding an alpha coefficient of .89, were retained.

Juror interest was measured using the following three scales:

While watching this witness, I was:

______ very interested

______ interested

______ somewhat interested

______ undecided

______ somewhat uninterested

______ uninterested

______ very uninterested

While watching this witness, my mind wandered:

______ all of the time
______ most of the time
______ quite often
______ some of the time
______ occasionally
______ rarely
______ never

I found the testimony presented by the witness:

______ very easy to follow
______ easy to follow
______ somewhat easy to follow
______ undecided
______ somewhat difficult to follow
______ difficult to follow
______ very difficult to follow

These three items yielded an alpha coefficient of .70.

Results

This section presents the results of the data analyses for the 25 hypotheses posited earlier. The results will be discussed in four sections. The first three sections consider the effects of witness type, the effects of camera shot for the strong witness, and the effects of camera shot for the weak witness. For these sections, the significant results will be presented first, followed by the nonsignificant results. The fourth section will discuss the acceptability of the general interaction hypothesis (Hypothesis 25).

Two-way analysis of variance was used to test the effects of camera shot and witness type upon each of the eight dependent variables. The Newman-Keuls procedure was employed for comparisons among cell means. For all statistical tests, the .05 level of significance was required.

The effects of witness type. The presentational style of the witness significantly influenced jurors' ratings of witness composure. The means and analysis of variance summary are reported in Table 46. The mean composure ratings indicate that the strong witness was perceived more composed than the weak witness in all three comera shots. The results of the Newman-Keuls test indicated that all three differences were significant. Moreover, the strength of the relationship is large ($\eta^2 = .50$).

Perceptions of the witness' qualification were significantly affected by the presentational style of the witness. The mean qualification ratings are reported in Table 47. Inspection of the means reveals that the strong witness was perceived more qualified than the weak witness in all three camera shots. However, the results of the Newman-Keuls test indicated that only the ratings in the close-up shot were significantly different. A measure of the strength of the relationship indicated the effect obtained is small ($\eta^2 = .03$).

The perceived dynamism of the witness was also significantly affected by witness type. The mean dynamism ratings are reported in Table 48. Examination of the means indicates that the strong witness was perceived significantly more dynamic than the weak witness in all three camera shots. In addition, the strength of the relationship is large ($\eta^2 = .40$).

TABLE 46

Means and Analysis of Variance Summary of the Effects of Camera Shot and Witness Type on the Assessment of the Witness' Composure*

	Strong Witness	Weak Witness	$\bar{X}$
Close-up	37.33_a	28.52_b	32.93
Medium	37.74_a	22.78_c	30.26
Long	39.62_a	24.37_c	32.00
$\bar{X}$	38.23	25.22	$\bar{X}$ = 31.73

Source	Sum of Squares	df	Mean Square	F	η^2
Camera Shot	197.98	2	98.99	2.46	-----
Witness Type	6857.51	1	6857.51	170.08***	.50
Camera Shot X Witness Type	357.38	2	178.69	4.43**	.03
Within Groups	6289.19	156	40.32		
Total	13702.06	161			

* Means containing a common letter do not differ significantly.

** $p < .05$

*** $p < .001$

TABLE 47

Means and Analysis of Variance Summary of the Effects of Camera Shot and Witness Type on the Assessment of the Witness' Qualification*

	Strong Witness	Weak Witness	$\bar{X}$
Close-up	24.37_a	22.04_b	23.20
Medium	23.44_{ab}	22.85_{ab}	23.15
Long	23.81_{ab}	22.92_{ab}	23.37
$\bar{X}$	23.88	22.60	$\bar{X} = 23.40$

Source	Sum of Squares	df	Mean Square	F	η^2
Camera Shot	1.44	2	.72	<1	-----
Witness Type	65.49	1	65.49	4.59**	.03
Camera Shot X Witness Type	23.42	2	11.71	<1	------
Within Groups	2227.26	156	14.28		
Total					

* Means containing a common letter do not differ significantly.

** $p < .05$

TABLE 48

Means and Analysis of Variance Summary of the
Effects of Camera Shot and Witness Type on the
Assessment of the Witness' Dynamism*

	Strong Witness	Weak Witness	$\bar{X}$
Close-up	19.48_a	14.89_b	17.19
Medium	19.88_a	14.15_b	17.02
Long	20.11_a	13.59_b	16.85
$\bar{X}$	19.83	14.21	$\bar{X}$ = 17.02

Source	Sum of Squares	df	Mean Square	F	η^2
Camera Shot	3.00	2	1.50	<1	-----
Witness Type	1277.93	1	1277.93	105.44**	.40
Camera Shot X Witness Type	25.35	2	12.67	1.05	-----
Within Groups	1890.67	156	12.12		
Total	3196.95	161			

* Means containing a common letter do not differ significantly.

** $p < .001$

The presentational style of the witness significantly influenced the amount of information retained by the jurors. The mean retention scores are reported in Table 49. Inspection of the means reveals that jurors retained more information when exposed to the strong witness in the close-up and medium shots. In the long shot, they retained more information when exposed to the weak witness. Results of the Newman-Keuls test indicated that only the differences found in the close-up and medium shots were significant. Overall, jurors retained more information when exposed to the strong witness. Clearly, the retention scores in the close-up and medium shots are the major contributors to this effect. It should be noted that the strength of the relationship is small ($\eta^2 = .02$).

The amount of interest expressed by jurors was also significantly affected by the presentational style of the witness. The mean interest scores are reported in Table 50. Jurors expressed greater interest when exposed to a strong witness than a weak witness for all three camera shots. The results of the Newman-Keuls test indicated that only the interest ratings in the close-up and medium shots were significantly different. A measure of the strength of the relationship indicated a moderate effect ($\eta^2 = .10$).

The means and analysis of variance summary for the dependent variables of safety, authority, and character are reported in Tables 51, 52, and 53. The results of these analyses indicated that the presentational style of the witness had no significant effect upon these variables.

The effects of camera shot for the strong witness. Perceptions of the strong witness' authority were found to be significantly affected by the camera shots. The mean authority ratings are reported in Table 52. Inspection of the means indicates that the strong witness was perceived most authoritative in the close-up shot and least authoritative in the long shot. Moreover, the authority ratings

TABLE 49

Means and Analysis of Variance Summary of the Effects of Camera Shot and Witness Type on Retained Information*

	Strong Witness	Weak Witness	$\bar{X}$
Close-up	36.89_{ac}	36.26_{b}	35.07
Medium	37.74_{ac}	33.00_{b}	35.37
Long	34.70_{abc}	36.85_{c}	35.78
$\bar{X}$	36.44	34.37	$\bar{X}$ = 35.41

Source	Sum of Squares	df	Mean Square	F	η^2
Camera Shot	13.48	2	6.74	<1	----
Witness Type	174.22	1	174.22	3.99*	.02
Camera Shot X Witness Type	369.33	2	184.67	4.23*	.05
Within Groups	6798.07	156	43.58		
Total	7355.10	161			

*Means containing a common letter do not differ significantly.

**$p < .05$

TABLE 50

Means and Analysis of Variance Summary of the Effects of Camera Shot and Witness Type on the Assessment of Juror Interest*

	Strong Witness	Weak Witness	$\bar{X}$
Close-up	14.56_a	11.92_b	13.24
Medium	15.07_a	11.81_b	13.44
Long	14.07_a	13.33_{ab}	13.70
$\bar{X}$	14.57	12.36	$\bar{X}$ = 13.46

Source	Sum of Squares	df	Mean Square	F	η^2
Camera Shot	5.81	2	2.91	<1	----
Witness Type	197.78	1	197.78	18.13**	.10
Camera Shot X Witness Type	46.38	2	23.19	2.13	----
Within Groups	1702.30	156	10.91		
Total	1952.27	161			

*Means containing a common letter do not differ significantly.

**$p < .001$

TABLE 51

Means and Analysis of Variance Summary of the Effects of Camera Shot and Witness Type on the Assessment of the Witness' Safety

	Strong Witness	Weak Witness	$\bar{X}$
Close-up	21.22	21.52	21.37
Medium	21.96	20.89	21.43
Long	21.26	21.37	21.31
$\bar{X}$	21.48	21.26	$\bar{X} = 21.37$

Source	Sum of Squares	df	Mean Square	F	η^2
Camera Shot	.33	2	.17	<1	-----
Witness Type	2.00	1	2.00	<1	-----
Camera Shot X Witness Type	14.93	2	7.46	<1	-----
Within Groups	2408.52	156	15.44		
Total	2425.78	161			

TABLE 52

Means and Analysis of Variance Summary of the Effects of Camera Shot and Witness Type on the Assessment of the Witness' Authority*

	Strong Witness	Weak Witness	$\bar{X}$
Close-up	19.92a	17.63_{ac}	18.78
Medium	18.66_{ab}	16.03_{c}	17.35
Long	16.77_{bc}	18.15_{ac}	17.46
$\bar{X}$	18.46	17.27	$\bar{X}$ = 17.86

Source	Sum of Squares	df	Mean Square	F	η^2
Camera Shot	67.94	2	33.97	1.68	-----
Witness Type	56.89	1	56.89	2.82	-----
Camera Shot X Witness Type	133.00	2	66.50	3.29**	.04
Within Groups	3151.19	156	20.20		
Total	3409.02	161			

* Means containing a common letter do not differ significantly.

** $p < .05$

TABLE 53

Means and Analysis of Variance Summary of the Effects of Camera Shot and Witness Type on the Assessment of the Witness' Character

	Strong Witness	Weak Witness	$\bar{X}$
Close-up	35.26	33.93	34.59
Medium	34.74	34.56	34.65
Long	33.15	34.44	33.80
$\bar{X}$	34.38	34.31	$\bar{X}$ = 34.35

Source	Sum of Squares	df	Mean Square	F	η^2
Camera Shot	24.53	2	12.27	<1	-----
Witness Type	.22	1	.22	<1	-----
Camera Shot X Witness Type	46.93	2	23.46	<1	-----
Within Groups	5514.96	156	35.35		
Total	5586.64	161			

in the medium shot were higher than in the long shot, but lower than in the close-up. The results of the Newman-Keuls test indicated that only the mean authority ratings in the close-up and long shots differed significantly.

The means and analysis of variance summary for the dependent variables of composure, safety, qualification, dynamism, character, information retention, and interest are reported in Tables 46, 51, 47, 48, 53, 49, and 50 respectively. The results of the analyses indicated that camera shot had no significant effect upon these variables for the strong witness.

The effects of camera shot for the weak witness. The results for the effects of camera shot for the weak witness yielded two significant effects. Camera shot was found to have a significant effect upon jurors' perceptions of the weak witness' composure and the amount of information retained by jurors.

The mean composure ratings for the weak witness are reported in Table 46. Inspection of the means indicates the weak witness was perceived most composed in the close-up shot and least composed in the medium shot. The results of the Newman-Keuls test reveal that the weak witness was perceived significantly more composed in the close-up than in either the medium or long shots. The composure ratings in the medium and long shots were not found to differ significantly.

The mean information retention scores are reported in Table 49. Jurors retained the greatest amount of information in the long shot, while jurors exposed to the medium shot of the weak witness retained the least amount of information. The results of the Newman-Keuls test indicated that the information retention scores were significantly greater in the long shot than in either the medium or close-up shots. The information retention scores in the medium and close-up shots did not differ significantly.

The means and analysis of variance summary for the dependent variables of safety, qualification, dynamism, authority, character, and interest are reported in Tables 51, 47, 48, 52, 53, and 50 respectively. The results of the analyses indicated that camera shot had no significant effect upon these variables for the weak witness.

Summarizing the results of the data analyses discussed thus far, the presentational style of the witness significantly influenced the variables of composure, qualification, dynamism, information retention, and interest. Camera shot had a significant effect upon jurors' perceptions of the strong witness' authority and the weak witness' composure. Moreover, camera shot had a significant impact upon the amount of information retained by jurors exposed to the weak witness. No other significant effects were obtained for either camera shot or witness type. Thus, the data supported Hypotheses 1, 3, 4, 7, and 8; and partially supported Hypotheses 13 and 23. Hypotheses 2, 5, 6, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 24 were not supported by the data and therefore were rejected.

Given the lack of support for 14 of the 16 hypotheses posited for the effects of camera shot, Hypothesis 25 (the general interaction hypothesis) was rejected. Still, it should be noted that the results yielded three significant interaction effects. Specifically, camera shot interacted with witness type producing significant effects upon the variables of composure, authority, and interest. The nature of these interactions has already been discussed in terms of their simple main effects. The effects of camera shot and witness type upon the variables of composure and information retention warrant further inspection, since witness type alone significantly affected these variables. Therefore, additional analysis was necessary to determine if the main effect for witness type could be interpreted given that significant interactions were also obtained.

Keppell (1973) contends that when both significant main effects and interactions are obtained, the interpretability of the main effects depends upon whether the interaction is ordinate or disordinate. An ordinate interaction occurs when the relative ranking of the levels of one factor does not change at the different levels of the other factor. A disordinate interaction occurs when the relative ranking of the levels of one factor changes at the different levels of the other factor.

The mean composure ratings for the strong and weak witness are plotted as a function of camera shot in Figure 4. Inspection of these plots indicates that the strong witness was consistently perceived to be more composed than the weak witness at all three levels of camera shot. Therefore, the interaction is ordinate, allowing the main effect for witness type to be interpreted.

The mean information retention scores for jurors exposed to the strong and weak witness are plotted as a function of camera shot in Figure 5. Inspection of the plots indicates that jurors exposed to a close-up or medium shot of the strong witness retained more information than jurors exposed to the same shots with a weak witness. For the long shot, however, jurors exposed to the weak witness retained more information than jurors exposed to the strong witness. Therefore, the interaction is clearly disordinate since no consistent pattern emerged. Thus, no general conclusion regarding the effect of witness type upon information retention can be made.

Discussion

The results of this study revealed that a number of significant effects were produced by witness type and camera shot. This section discusses those effects and provides explanations for their occurrence. The effects for witness type will be discussed first, followed by a discussion of the effects of camera shot for each witness type. Implications of the findings and recommendations to the legal community will also be provided.

FIGURE 4

Graphic Representation of Witness' Composure as a Function of Camera Shot and Witness Type

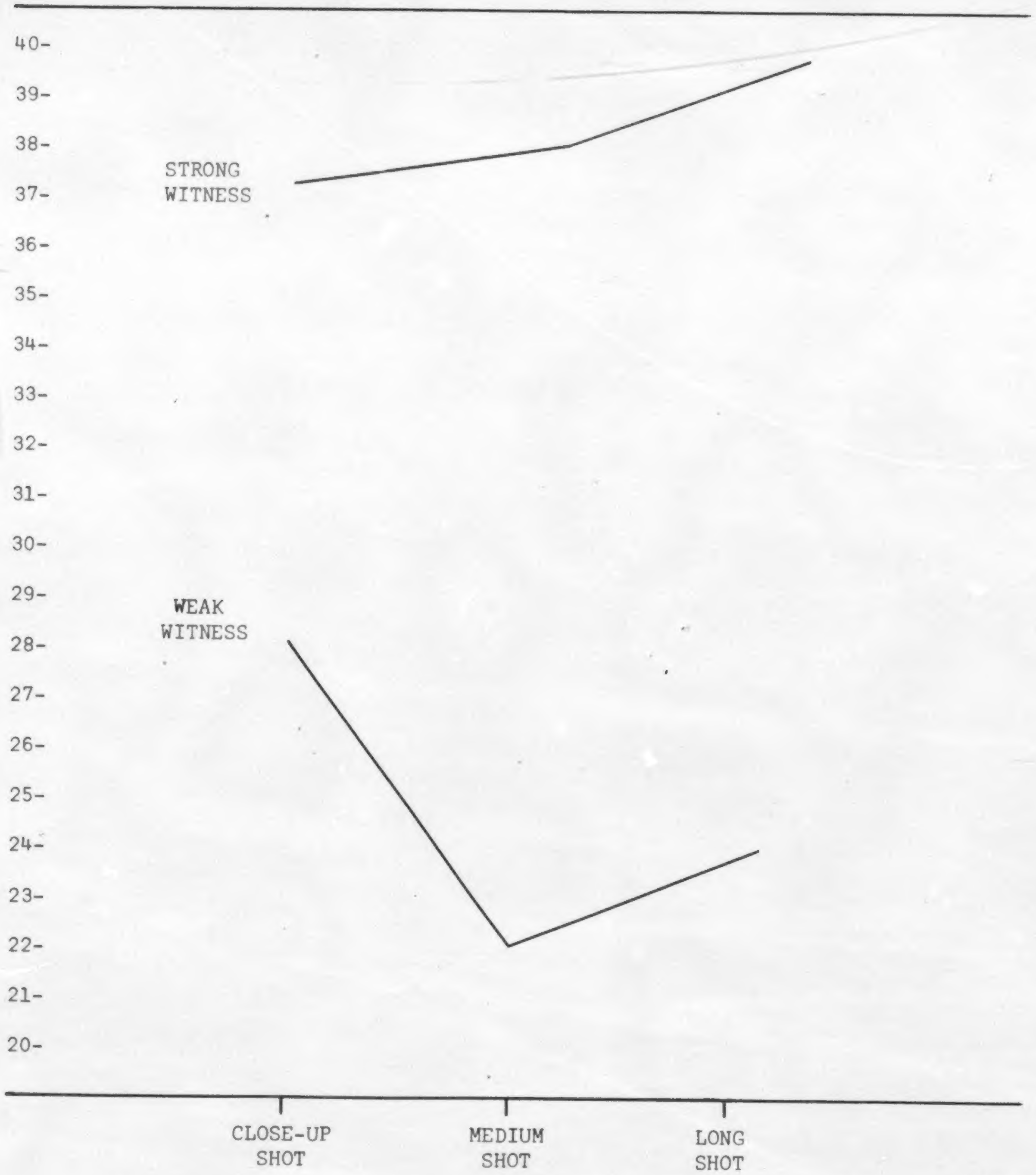
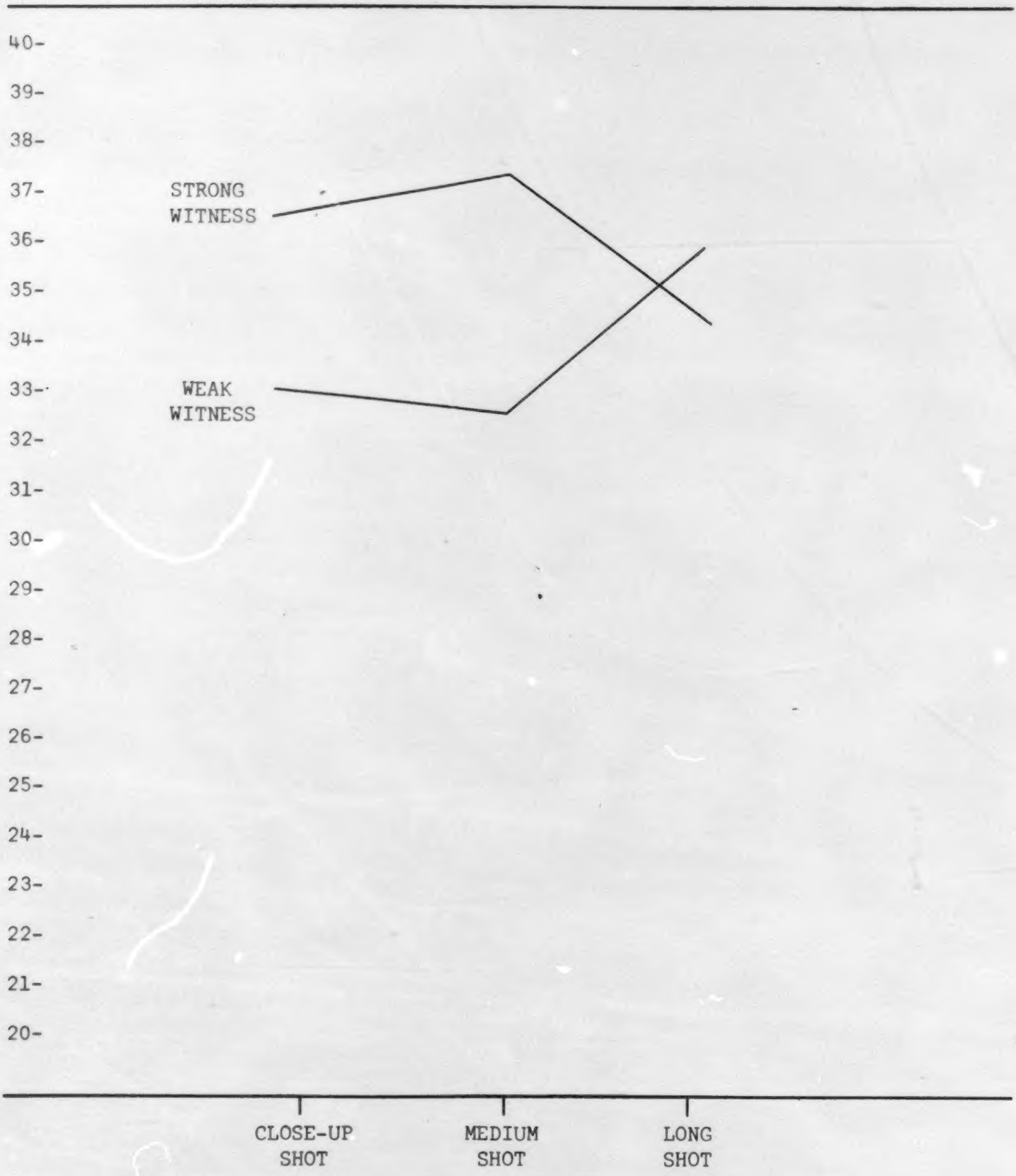


FIGURE 5

Graphic Representation of Information Retention as a Function of Camera Shot and Witness Type



The effects of witness type. The presentational style of the witness exerted a significant impact on the jurors. Specifically, jurors perceived the strong witness to be significantly more composed, qualified, and dynamic than the weak witness. Moreover, jurors exposed to a strong witness retained significantly more information and expressed greater interest than their counterparts who were exposed to a weak witness.

As mentioned earlier, the composure measure was used to check the manipulation of witness type. The items of this measure were derived from the literature as indicators of the presentational styles of strong and weak witnesses. The results indicated that the strong witness was perceived significantly more composed than the weak witness at all three levels of camera shot. Therefore, the witness type manipulation was considered successful.

It should be noted that the results also revealed a significant camera shot by witness type interaction for the composure variable. However, further analysis indicated that this interaction was ordinate, allowing interpretation of the main effect for witness type. The interaction effect will be discussed later in this section.

The results also indicated that the strong witness was perceived as more qualified than the weak witness. This finding replicates the results obtained by previous researchers (Miller & Hewgill, 1964; Sereno & Hawkins, 1967). The findings also indicated that the strong witness was perceived as significantly more qualified only in the close-up shot. Hence, the difference in the close-up shot supplied the greatest contribution to the overall effect. A plausible explanation for this result is that the close-up shot tended to emphasize the characteristics of the witness and focused the jurors' attention to those characteristics. This interpretation is supported by the fact that the strong witness received his highest ratings in the close-up shot, while the weak witness received his lowest ratings in the close-up shot.

The findings revealed that jurors perceived the strong witness to be significantly more dynamic than the weak witness for all three camera shots. A possible explanation for this finding stems from the behavioral characteristics of the two witness types. The strong witness' presentational style was fluent and nonhesitant. The weak witness' presentational style was nonfluent and hesitant. Thus, the difference in dynamism ratings may be largely due to differences in presentational fluency. This interpretation is supported by the results of previous research (Miller & Hewgill, 1964; Sereno & Hawkins, 1967; McCroskey & Mehrley, 1969). The finding for the effect of witness type on dynamism replicates the findings of these previous studies.

The amount of information retained by the jurors was also affected by witness type. Overall, jurors exposed to the strong witness retained significantly more information than jurors exposed to the weak witness. The results also revealed a significant camera shot by witness type interaction. Further inspection indicated that this interaction was disordinate, making it difficult to interpret any general effect for witness type. Therefore, the specific effects for the interaction will be discussed in lieu of the general main effect.

An inspection of the mean information retention scores revealed that jurors retained more information when exposed to the strong witness in the close-up and medium shots. In the long shot, jurors exposed to the weak witness retained more information than jurors exposed to the strong witness. Subsequent analysis revealed that only the differences in the close-up and medium shots were significant.

A plausible explanation for this finding concerns the nonverbal behavior of the weak witness. As mentioned earlier, his behaviors included fidgeting, tapping his fingers and feet, tensing his muscles, occasional sighs, etc. These behaviors may have been distracting to the jurors. If so, the medium and close-up shots would have emphasized those cues, increasing the amount of distraction. The long shot would not have emphasized the cues to the same extent; thus, it may have been only mildly distracting.

Research on the effects of distraction upon information retention has produced seemingly inconsistent results. Distraction has been found to increase recall of message content (Silverman & Regula, 1968) and to decrease recall of message content (Vohs, 1964; Gardner, 1966; Haaland & Vankatesan, 1968). Baron, Baron, and Miller (1973) suggest that one factor which may account for the discrepancy in results is whether the distraction can be ignored. They argue that if a distracting stimulus is sufficiently severe, persons may attend more closely to the distracting stimulus than to the content of the message. Conversely, if the distraction is mild, persons may attempt to block the distracting stimulus by attending more closely to the content of the message.

Assuming that the cues emitted by the weak witness were more distracting in the close-up and medium shots than in the long shot, then jurors exposed to the weak witness in the close-up and medium shots may have been attending more closely to the distracting behaviors than to the content of the message. On the other hand, the jurors exposed to the long shot of the weak witness may have attended more closely to the information presented in order to block the distracting behaviors. This possibility would explain the lower information retention scores obtained in the close-up and medium shots, as well as the increase in retention in the long shot of the weak witness.

The last variable significantly affected by witness type was the amount of interest expressed by the jurors. The results revealed that jurors consistently expressed greater interest when exposed to the strong witness as opposed to the weak witness. However, significant differences were obtained only for the close-up and medium shots.

Conceivably, this general finding may result from differences in the fluency of the witnesses. Given the fluent presentational style of the strong witness, it seems reasonable to assume that jurors found it easier to follow his testimony. The greater difficulty associated with following the testimony presented by the weak witness may account for the lower interest ratings reported by the jurors who viewed that witness.

Another plausible explanation for this general finding stems from the dynamism ratings of the strong and weak witnesses. Recall that the strong witness was perceived as significantly more dynamic than the weak witness. Conceivably, jurors experience greater interest when they are exposed to a dynamic source. Support for this explanation is found in the reasonably strong correlation between dynamism and interest ($r = .30$).

The lack of significant differences for jurors' expressed interest in the long shot deserves attention. This effect may have resulted from the nonverbal cues of the weak witness. As argued earlier, the nonverbal cues of the weak witness may have been distracting to the jurors. Moreover, it was argued that distraction would be reduced in the long shot. This reduction may have made it easier for the jurors to follow the testimony presented by the weak witness, thus increasing the amount of interest.

Implicit in the explanation for the effect of witness type on jurors' interest is a positive relationship between interest and information retention. Since it was argued that interest increased as a result of the ease of following the testimony presented by the witness, it seems reasonable to assume that jurors would retain more information if they could follow the testimony better. To test this reasoning, the correlation between interest and information retention was computed, correcting for attenuation. The resulting correlation was quite high ($r = .60$). Thus, it appears that there is a strong association between the amount of interest expressed by the jurors and the amount of information retained. Notably, the pattern of effects for these two variables is identical.

The effects of camera shot. The results indicated that camera shot had a significant effect upon jurors' perceptions of the strong witness' authority and the weak witness' composure. In addition, camera shot had a significant effect upon the amount of information retained by jurors exposed to the weak witness.

The results for the effect of camera shot upon perceptions of the strong witness' authority indicated that the strong witness was perceived significantly more authoritative in the close-up shot than in the long shot. One explanation for this result is that the close-up shot emphasized the characteristics of the strong witness more than the long shot, resulting in higher authority ratings for the former shot. Given this reasoning, one would expect the weak witness to be perceived significantly more authoritative in the long shot than in the close-up shot. The mean authority ratings for the weak witness were higher in the long shot than in either the close-up or medium shots, but the differences were not significant.

It is not immediately clear why the effect failed to hold for the weak witness. One possible explanation is that jurors interpreted the nonverbal cues emitted by the weak witness differently. Some support for this contention is offered by jurors' responses to an open-ended question regarding what they liked least about the trial. Some jurors exposed to the weak witness derogated the questioning attorney for making the witness nervous. Others commented on the evasiveness of the witness. From an attribution viewpoint, it seems reasonable to assume that perceptions of the weak witness will differ between jurors who attributed the witness' behavior to be a result of the attorney's questioning, as opposed to jurors who attributed the witness' behavior to his own evasiveness (see, Jones & Davis, 1965; Kelley, 1967; Shaver, 1975). Thus, there may have been some ambiguity associated with the cues presented by the weak witness, which resulted in jurors making varying attributions for the weak witness' behavior.

Camera shot also significantly influenced jurors' perceptions of the weak witness' composure. The results indicated that the weak witness was perceived as more composed in the close-up shot than in either the medium or long shots. The composure ratings in the medium and long shots did not differ significantly.

A plausible explanation for this pattern of effects surrounds the behavioral cues used by the weak witness to indicate low composure. The behaviors of the weak witness included nonfluent speech, low eye contact, leaning away from the questioning attorney, fidgeting, tapping of fingers and feet, and a closed body position. These behaviors, as well as the measure of composure, were derived from the literature on verbal and nonverbal behavior (Reece & Whitman, 1962; Mehrabian, 1969, 1971; Harrison, 1974). A majority of the nonverbal cues indicative of low composure emanate from the body and not the face. Of course, the paralinguistic cues also indicate composure, but these were consistent across all three shots. The bodily cues were not consistent, for they were not seen in the close-up shot. Assuming the bodily cues add information revealing the degree of composure, then it makes sense that the weak witness would appear more composed in the close-up shot where these cues are absent. Additional support for this interpretation comes from the composure ratings for the long shot. In the long shot, the bodily cues are available, but they are not as prominent as in the medium shot. Moreover, facial affect cues are also not as prominent as in the close-up shot. Given the above explanation, one would expect to find the composure ratings for the weak witness to be higher in the long shot than in the medium shot, but lower than in the close-up shot. The data revealed this pattern of relationships. Still, it should be noted that the overall effect was weak ($\eta^2 = .03$).

The final relationship to be discussed concerns the effect of camera shot on the amount of information retained by jurors exposed to the weak witness. The results indicated that jurors retained significantly more information in the long shot than in either the medium or close-up shots. The amount of information retained in the medium and close-up shots did not differ significantly.

The pattern of effects obtained can be explained by the nonverbal behavior of the weak witness. Earlier it was argued that his nonverbal behaviors may have been distracting to jurors, and that the distraction may have been more pronounced in the close-up and medium shots than in the long shot. Therefore, jurors may have attended more closely to the cues of the weak witness in the close-up and medium shots than to the information presented. In the long shot, the bodily cues may have been only mildly distracting. Thus, jurors could have attended more closely to the information presented in order to block the distracting cues. This possibility would explain why jurors retained more information in the long shot for the weak witness. However, once again it should be noted that while the effect was significant, the strength of the relationship was weak ($\eta^2 = .05$).

Summary

The results of this study revealed a number of significant effects for witness type, but few effects for camera shot. In fact, camera shot alone had no significant effect upon any of the dependent variables examined. Camera shot did interact with witness type producing significant effects upon the jurors' perceptions of the strong witness' authority and the weak witness' composure. Moreover, camera shot affected the amount of information retained by jurors exposed to the weak witness.

Clearly, the number of significant effects obtained for camera shot is far less than the number predicted. The majority of the hypotheses for the effects of camera shot were rejected. This might lead one to conclude that the conventional wisdom of television and film producers concerning the effects of different camera shots is in error. Such a conclusion would be overstepping the data. Conceivably, the lack of significant differences between the shots may be a function of the way in which they were employed. Once established, all shots remained static, with no other shots introduced. The effects may very well have been different if different shots were employed contiguously. Thus, the close-up shot may consistently provide dramatic emphasis only when preceded by a longer shot. Moreover, the emphasis may increase if the preceding shot is a long shot rather than a medium shot.

The present study did not address these issues; instead, it compared the different shots presented statically. Therefore, it is important to note that the findings do not generalize to the numerous combinations of shots that could be employed.

Implications and Recommendations

Given the pattern of results, the decision to use one camera shot over another is dependent upon the type of witness to be videotaped. If a strong witness is videotaped, and there is a concern for the perceived authority of the witness, then a close-up shot should be employed. If authority is not a concern, then it does not really matter which shot is used.

If a weak witness is being videotaped, and there is a concern for the perceived composure of the witness, then a close-up shot is recommended. On the other hand, if there is a greater concern for the amount of information retained by the jurors, then a long shot is recommended.

Still, a final note concerning the selection of camera shots is worth mentioning. In all cases, the effects of the interaction of camera shot and witness type were small. At best, five percent of the variance could be explained by these interactions. From a practical standpoint, five percent is quite minimal. Thus, in the final analysis, given a strong or weak witness, it probably does not matter whether a close-up, medium, or long shot is used.

GENERAL CONCLUSIONS

In reporting each of the studies, we have tried to identify some of the important implications of our findings for legal professionals and social scientists alike. Consequently, this final section is limited to a brief discussion of several of the general conclusions emerging from the studies.

Apparently, individual characteristics of attorneys, witnesses, and other trial participants exert a greater impact on juror response than the technological variations and techniques addressed in the studies. Stated differently, most of the studies failed to produce many main effects for the medium of presentation (live or videotape) per se, but they did reveal interactions between particular trial participants and the method by which the participant communicated information or arguments to jurors. In the study examining the use of videotaped depositions in otherwise live trials, one expert witness proved to be more effective when testifying live, while the other proved to be more effective when testifying on videotape. Similarly, in the study investigating the effects of various camera shots on jurors' perceptions of the witness, the strong witness was generally more effective in close-up shots, but the weak witness fared somewhat better in longer shots.

These source by medium interactions are hardly surprising. What they suggest about the use of videotaped trial materials, as opposed to live trials, can be summarized as follows: there is no magic associated with any medium of presentation that renders it clearly superior to another, at least in terms of its ability to influence some audience such as a jury. Moreover, when videotape is considered alone, no single shot or camera strategy will be uniformly most effective. Instead, some attorneys and witnesses will exert the greatest impact on the jury in a live setting, whereas others will be more effective on videotape. In a similar vein, some attorneys and witnesses will enhance their effectiveness by being taped close-up, while others will profit from the reduction in detail resulting from a longer shot.

Given the many possible production techniques available and their differing effects for particular sources, the most prudent policy for taping depositions and trials involves a minimum of camera movement. Probably rules for uniform procedure stipulating fixed cameras for all taped depositions represent the wisest course of action in light of the little that is presently known about production techniques and the almost infinite number of possible technical variations.

Having settled for the less than startling conclusion that some trial participants communicate more effectively on videotape than in a live setting while the effectiveness of others is reduced, what can we say about the wisdom of expanded use of videotaped trial materials? Obviously, this question transcends the scope of our research. The answer to it depends largely on the extent to which the live trial is viewed as an ultimate standard of comparison. If the live trial is seen in this light, any other mode of presentation that results in different effectiveness profiles for trial participants is likely to be viewed skeptically. Conversely, if it is assumed that there is nothing inherently superior about the live setting, then wider use of videotaped court materials is likely to be deemed desirable, given that other advantages accrue from their use.

As we have noted, one ostensible additional advantage of videotape is the opportunity it affords to expunge inadmissible materials from the trial. The several studies we have conducted suggest that the impact of typical instances of inadmissible testimony may not be as marked as some writers have argued. In no case did the presence or absence of inadmissible materials exert a significant impact on jurors' verdicts or their perceptions of the contesting attorneys. Although jurors tended to bring up inadmissible testimony during deliberations, there was no evidence that the introduction of the testimony influenced the eventual verdict.

Naturally, our conclusions about inadmissible materials must be treated cautiously. In our studies, we attempted to use reasonably typical, somewhat mundane instances of inadmissible material. Undoubtedly, some kinds of inadmissible testimony -- for instance, dramatic, damning items of the type often seen in courtroom television dramas -- are capable of influencing juror decision-making. Because of this fact and because there was some evidence that jurors discussed the testimony during deliberation, deletion of inadmissible materials still seems like a wise course of judicial action. When editing such materials, the clean edit is the most preferable technique, since it minimizes the distraction experienced by jurors.

Findings of several studies revealed that videotaped presentation of testimony does not influence a juror's ability to detect deceptive testimony; the notion that people are better detectors of lying when they are observing a "live performance" simply was not supported by our findings. What does emerge clearly is a picture of relative futility when it comes to detecting deception on the part of strangers. Regardless of the medium of presentation, none of our groups of role-playing jurors were very good deception detectors. Interestingly enough, the best of a relatively bad lot of performances occurred when the jurors read a written transcript of the testimony; i.e., when they were provided with a minimal amount of nonverbal and paralinguistic information. This result suggests that much of the conventional wisdom about liars giving themselves away by their nonverbal behaviors may lack a solid empirical foundation.

Considered as a whole, the findings fail to indicate that the use of videotaped trial materials produces any deleterious effects on juror response: *in terms of the behaviors we have studied, "reel" is at least roughly equivalent to "real"*. Obviously, however, the issues we have examined constitute but one aspect of the numerous political, economic, social, and legal considerations that impinge upon the decision of whether to make wider use of videotaped court materials. Hopefully, our research will contribute to a more informed overall view of this complex policy question. Having embraced this relatively modest objective, we rest our case.

FOOTNOTES

[1] As was the case with the award variable, this analysis is an unweighted means analysis. Further, all subsequent analyses of variance tests are unweighted means analyses.

[2] The results of this analysis are computed on an N = 105. Because one subject's questionnaire contained such a large amount of missing data, only his award measure was considered in the analysis. In general, missing data are deleted pairwise for all analyses presented.

[3] That is, the correlation is corrected for attenuation in the standard manner. Coefficient alpha was used as the estimate of reliability. It was assumed that the mode of presentation was perfectly measured. Hence, the corrected correlation is a rather conservative estimate of the relationship between the two variables.

[4] All of the negative correlations reported in this study are a result of the manner in which mode of presentation was dummy coded, i.e., live = 0 and videotape = 1. They only indicate a relationship exists but not an inverse relationship.

[5] The sending capacity of a part of the body can be measured by three indices: average transmission time, number of discriminable stimulus patterns which can be emitted, and visibility (Ekman & Friesen, 1969, p. 93).

[6] The data were subjected to logarithmic transformation as a means of dealing with multicollinearity in the model. Since regression analysis assumes that underlying relationships among variables are linear and additive, and the effects of variations in available information via variations in communication channel were not expected to be necessarily additive, logarithmic transformation seemed appropriate because it makes non-linear, non-additive relationships linear and additive (Namboodiri, Carter & Blalock, 1975, p. 489). The remainder of the effect of multicollinear variables should have been accounted for by the path from nonverbal to total information.

[7] Originally the authors attempted to analyze the models using LISEREL: A General Program for Estimating a Linear Structural Equation System Involving Indicators of Unmeasured Variables, by Jöreskog and van Thillo. However, we could not obtain an exact maximum likelihood solution. Instead, the program during the minimization procedure estimated a matrix which was not positive definite, and aborted. The program indicated that this could be due to the fact that insufficient arithmetic precision is used. All approximate solutions, however, indicated that the models would likely have been rejected. Similar problems have arisen when other researchers have attempted to subject communication data to a maximum likelihood procedure.

[8] Norman H. Nie, C. Hadlai Hull, Jean G. Jenkins, Karin Steinbrenner, and Dale H. Bent, Statistical Package for the Social Sciences. New York: McGraw-Hill, 1970.

Karl Jöreskog and Marielle van Thillo, LISEREL: A General Computer Program for Estimating a Linear Structural Equation System Involving Multiple Indicators of Unmeasured Variables. Princeton, New Jersey: Educational Testing Service, 1972.

[9] The same legal experts who estimated the number of objections also estimated the average length of objections. One minute constitutes the average length.

[10] The actors were selected from areas that were very distant from the geographical area that the sample was to come from. This was to ensure that the jurors would not recognize an actor and thus realize the trial was a reenactment.

[11] The descriptions of the techniques were obtained through personal conversations with Judge James McCrystal, and Mr. Larry Stone of Video-Record. Video-Record is a videotaping company in Columbus, Ohio. The firm videotaped many complete trials and depositions which were used in Judge McCrystal's court.

[12] Personal conversation with Mr. Larry Stone.

[13] The term "frame" is really a misnomer. Videotape does not actually have frames in the same sense that film has frames. What the word frame here refers to is the smallest unit that a videotape can be broken into, which is similar to a frame in film, although physically very different.

[14] As part of the research not reported in this study, confederates were used to examine group deliberation behavior. They were also instructed to note any suspicion concerning the validity of the trial. Two jurors were suspicious and were subsequently dropped from the analysis.

[15] In light of the fact that the groups had different sample sizes, a harmonic mean was computed for each analysis that employed Dunnett's t-test (see Winer, 1971).

[16] The objections were written such that they should have lasted for 60 seconds. However, due to the actors' variation in speech rate, some objections were longer than 60 seconds. The range was from 58 seconds to 93 seconds.

[17] There have been studies conducted which have failed to support the distraction hypothesis (see Baron, Baron & Miller, 1973).

[18] The original study employed a third type of witness called the "modal witness." In the modal condition, the witness read the testimony, simulating the case where the witness' testimony is read into the record. In a replication of this study (Miller & Siebert, 1975) the modal condition was dropped for two major reasons: (1) it was unrealistic, and (2) subjects had difficulty determining whether they were supposed to rate the actual witness or the reader. The results of the replication supported the results of the original study for the effects of witness type. Therefore, the general results will be considered without regard for the modal condition.

[19] While the three shots of interest will only encompass the witness, a longer shot, which includes the two attorneys, will be used at the beginning and the end of the deposition in order to provide the jurors with a sense of location.

[20] The literature also contains the terms ethos and prestige for the same construct. For purposes of clarity, the present paper will consistently use the term credibility.

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